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# Chettinad Health City

## MEDICAL JOURNAL

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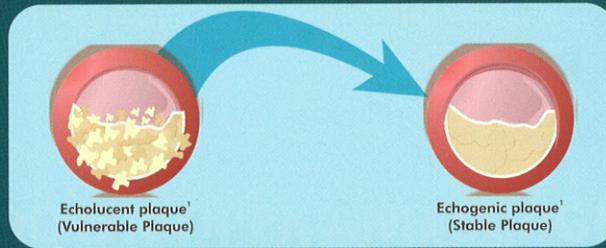
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Tamil Nadu - 603 103  
India  
T. +91 (0)44 4742 8300  
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Email:  
chettinadhealthcityjournal@gmail.com

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# Chettinad Health City

## MEDICAL JOURNAL

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## Editorial

### Vanakkam, Namaste, Greetings.

The first issue of Chettinad Health City Medical Journal both the online and print version were well received. You will find some e-mails from the readers in the letters to Editor. We are trying to incorporate as many suggestions as possible.

The work is in progress to get the journal indexed. This issue of the journal carries an interview with a very eminent medical personality- Prof.C.K Dhanasekharan an Oral-Maxillofacial surgeon and a doyen among Dental Surgeons of this country.

This issue also carries a review article outlining the care of the mechanically ventilated patient. Intensive care unit is the last place where one would like to land. However , it may be the place where some of us may end. ICU, just as it heals, may also harm (Anon). The article outlines the way to avoid such harm.

Most adults above the age of 40 yrs are on some medication. Cardiovascular drugs are the commonest in that age group. Every year more than 100,000 people die in US alone due to iatrogenic cause. Drug interaction is a significant cause of avoidable morbidity and mortality. An article outlines the drug interaction with cardiovascular drugs.

Non obstructive Azoospermia was considered untreatable few decades back. Today, almost 50 % of men with Non Obstructive Azoospermia can have a realistic hope of fatherhood. An original article outlines the predictive value of serum FSH and testicular size in sperm retrieval in Azoospermia.

Anaesthesia pervades all walks of medical practice today. The origin of Anaesthesia is traced in the pages of history.

There are several interesting case reports from the Dental , ENT, Surgical, Orthopaedic and Forensic Medicine departments.

The section on Letters to Editor also highlights the correspondence between a reader and the author of an article in the previous issue.

The usual column-Medical Update brings in lots of useful information from around the world.

We look forward to your valuable comments and suggestions.



**Dr.N.Pandiyan**

Chief Editor : Chettinad Health City Medical Journal

E-mail : [pandiyan1@yahoo.com](mailto:pandiyan1@yahoo.com)



## Original Article

### Predictive value of serum Follicle Stimulating Hormone and testicular volume as markers for the outcome of surgical spermatozoa retrieval in men with azoospermia

Dr.G.Kavitha<sup>1</sup>, Dr.N.Pandiyan<sup>2</sup>, Dr.Radha Pandiyan<sup>3</sup>, Dr.G.M.M.Reddy<sup>4</sup>

<sup>1</sup>Junior Embryologist, <sup>2</sup> Head of the Dept. and Chief Consultant, <sup>3</sup>Senior Consultant, Dept. of Reproductive Medicine, Chettinad Super Speciality Hospital (CSSH); <sup>4</sup>Assistant Professor, Dept. of Community Medicine, Chettinad Hospital and Research Institute (CHRI), Kelambakkam, Tamil Nadu, India.



Dr.G.Kavitha is a graduate in medicine from PSG Institute of Medical Science and Research, Coimbatore. She has completed her post graduation in Clinical Embryology from Chettinad University, Chennai. Dr. Kavitha has special interest in the areas of andrology and stem cells.

Corresponding author - Dr.G.Kavitha (dr.kavithagovindaraj@gmail.com)

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#### Abstract

**Background:** To predict the outcome of surgical retrieval of spermatozoa using serum FSH and testicular volume as markers in men with Azoospermia.

**Method:** It was a cross sectional study from February 2008 to July 2011 done at the Department of Reproductive Medicine at a tertiary care hospital. Forty seven men with Azoospermia who had undergone surgical testicular or epididymal spermatozoa retrieval were included in the study. The data was analyzed in two groups- serum FSH levels: 1-14 and > 14 IU/mL; testicular volumes were analyzed under 2 groups: <8 ml and ≥8 ml.

**Findings:** Spermatozoa were successfully retrieved in 57% of the men with azoospermia. Spermatozoa retrieval rates in the group of men with FSH values 1-14 IU/ml were 64.9% and > 14 IU/ml were 30% and the difference was statistically significant with a p value of 0.0479 and an odds ratio of 4.3. Regarding testicular volume, the spermatozoa retrieval in the group < 8 ml & ≥ 8 ml were 33.3% and 57.8% respectively, with a p value of 0.09 and odds ratio of 4.13

**Conclusion:** The chance of spermatozoa retrieval is 65% in men with normal FSH and it is a better predictor for surgical spermatozoa retrieval.

**Funding:** Nil

**Key Words:** Azoospermia, Follicle stimulating hormone, Spermatozoa retrieval, Testicular volume.

#### Introduction

Azoospermia is defined as absence of spermatozoa in a neat and centrifuged semen sample confirmed by repeat analysis done at 3-4 weeks interval as per WHO guidelines 2010. Azoospermia due to hypogonadotropic hypogonadism is treated by hormonal therapy. Structural chromosomal abnormalities are present in about 1% of azoospermic men. Karyotyping study has shown terminal Y chromosome deletions in azoospermic men who are phenotypically normal<sup>1</sup>. The treatment option for this group of men is surgical testicular spermatozoa retrieval. In group of men where the cause is due to bilateral vasal obstruction, epididymal spermatozoa retrieval can be offered. Success of testicular spermatozoa retrieval varies from 30-70 %<sup>2,3</sup> in azoospermic men with defective spermatogenesis. Surgical spermatozoa retrieval may involve multiple biopsies which is done either prior to oocyte pickup or concurrently. Retrieval of very few live spermatozoa

will be sufficient for treatment with ICSI. If there is no spermatozoa retrieval, then it results in stress and emotional disturbance to the couple. So it is important to predict the success of surgical spermatozoa retrieval preoperatively.

Y chromosome contains AZF region which is responsible for spermatogenesis. It is further divided into 3 subdivisions as AZFa, AZFb, AZFc. Mutations in AZFa and AZFb are not so common, but causes complete absence of spermatozoa in testes. Mutation in AZFc is most common, spermatozoa can be retrieved from testes in this group of men as a copy of it is present in chromosome 3<sup>1</sup>. To predict the presence of spermatozoa in testes by these mutational studies is expensive and the expensive equipment required are not available in most laboratories. It is therefore, necessary to identify markers which are inexpensive and readily available to predict the presence of sperm in testes.

Serum FSH level is an indicator of testicular function and in turn of spermatogenesis. Bulk of the testis is made of seminiferous tubules where spermatogenesis takes place. The objective of the present study is to explore the importance of serum FSH and Testicular volumes in azoospermic men as predictive markers, prior to surgical testicular exploration.

## Materials and Methods

The present study is a cross sectional retrospective study conducted in the Department of Reproductive Medicine at a tertiary care hospital (Chettinad Super Speciality Hospital) from February 2008 to July 2011. All men with azoospermia who have undergone surgical spermatozoa retrieval during the study period were included in the study, no sampling was done. Informed consent of the patients was taken prior to the surgical procedures.

Azoospermia was confirmed by repeat analysis of neat and centrifuged sample of semen done at an interval of 3-4 weeks. Serum FSH was determined by ELISA. Testicular volume was determined by clinical palpation done by a single Andrologist. The average of the testicular volume was taken for analysis. Surgical spermatozoa extraction was done either from testes or epididymis.

### a. Testicular Spermatozoa Extraction

Under general/spinal anaesthesia, multiple testicular biopsies were done and sent to embryology lab in HEPES (Hydroxy Ethyl Piperazine Ethane Sulfonic acid) based medium. The biopsied sample was minced using tuberculin syringe with needle under stereo zoom microscope. Spermatozoa were visualized under 10x inverted microscope. When spermatozoa were seen, they were cryopreserved for use in cases where it was done prior to oocyte pickup. If the procedure was done concurrently along with oocyte pickup, the spermatozoa were prepared and used for ICSI. A randomly selected sample was sent for histopathological examination and graded according to Johnson's scoring system.

### b. Epididymal Sperm Extraction

Three different procedures used for epididymal sperm extraction were Percutaneous Epididymal Sperm Aspiration (PESA), Microscopic Epididymal Sperm Aspiration (MESA) and Macroscopic Epididymal Sperm Aspiration (MAESA), all were done under general or spinal anaesthesia.

## Ethical clearance

No ethical clearance was required, as routine clinical data collected during the patients treatment process was analysed retrospectively. However, informed consent of the patient was taken prior to the surgical procedure. Confidentiality of the participants was strictly maintained during analysing and presenting the results.

## Statistical analysis:

Serum FSH levels and testicular volume were taken as the exposure parameters and surgical spermatozoa retrieval was taken as the outcome measure for the purpose of analysis. The men were divided into two groups based on FSH values (1-14 IU/mL and >14 IU/mL). Based on testicular volume men were divided into 2 groups (< 8 mL and ≥ 8 mL). The statistical association between the exposure and outcome parameters was assessed by using chi square test with yate's correction. The p-value and 95% CI were calculated. Statistical package for social sciences (SPSS), version 18 and EPIINFO were used for the analysis. P value < 0.05 was considered statistically significant.

## Results

A total of 47 azoospermic men were recruited, surgical testicular spermatozoa recovery was successful in 27 (57%) men. (Testicular spermatozoa retrieval in 48.6% and epididymal spermatozoa retrieval in 90%.)

Out of 47 men, 37 men were in normal FSH range (1-14 IU/mL) and spermatozoa were retrieved in 24 (64.9%) of them. In the elevated FSH level (>14 IU/mL) group there were 10 men and spermatozoa were retrieved in (30%) 3 of them as shown in Table 1.

**Table 1. Sperm retrieval in different FSH categories**

FSH Level (IU/ml)	Total Number of Men	No. of men with successful Sperm Retrieval (%)
1-14	37	24 (64.9) %
>14	10	3 (30) %

Based on testicular volume, men were divided into 2 groups as < 8 mL and ≥ 8 mL. There were totally 6 & 38 men in each group and spermatozoa were retrieved in 2 (33.3%) & 22(57.8%) men respectively as shown in Table 2.

Out of 47 men, 3 had bilateral hydrocele, so their volume could not be assessed clinically, hence excluded from the study.

Table 2. Sperm retrieval in different testicular volume categories

Testicular Volume (ml)	Total Number of Men	No. of men with successful Sperm Retrieval (%)
<8	6	2 (33.3)
≥8	38	22 (57.8)

On assessing the statistical association between FSH values and spermatozoa retrieval, the odds of retrieving spermatozoa is 4.3 times higher in men with normal FSH when compared to men with elevated FSH levels - Odds Ratio 4.3 with 95 % CI (Chi square with Fisher Exact test) and p-value 0.0479 and found to be significant. The positive predictive value is 65%.

On assessing the statistical association between testicular volume and spermatozoa retrieval, the odds ratio is 4.13 with 95% CI and p value is 0.09, which is not significant.

## Discussion

This analysis was aimed at validating the usefulness of most frequently used parameters like serum FSH concentration and testicular volume for clinical decision making in men with azoospermia.

The present study shows that increase in FSH levels (>14 IU/mL) leads to lower spermatozoa retrieval when compared to men with FSH in the normal range (1-14 IU/mL), which was statistically significant. These observations are consistent with the previous study<sup>4</sup> where increase in FSH levels showed decrease in spermatozoa retrieval rate which was statistically significant. Turunc et.al., (2010) reported a negative correlation between FSH levels and spermatozoa retrieval, but the correlation was not statistically significant. This is contrary to another study<sup>6</sup> reported earlier this year, which showed spermatozoa retrieval is lower in the group with FSH <15 IU/mL. Spermatozoa were retrieved in one man with FSH level as high as 37.1 IU/mL. The predictive value of testicular spermatozoa extraction was 69% for plasma FSH concentration in a study reported by Tournaye et al, (1997). This is comparable to our present study in which the predictive value is 65%.

In our study, testicular volume has been found to be a poor predictor of successful spermatozoa recovery. This is in consistency with the previous studies<sup>7,8</sup> where there is no statistically significant difference in testicular volume between men in whom spermatozoa were retrieved and in those where retrieval was not possible. A positive correlation between spermatozoa retrieval and testicular volume has been found in few studies<sup>4,5,9</sup>. Further, spermatozoa were retrieved in men with testicular size of 5 ml<sup>8</sup>, using micro Testicular Sperm Extraction (TESE) procedure in non-obstructive azoospermic patients. The positive predictive value for testicular volume ≥ 8 ml is 57.8%.

Many prior studies<sup>3,4,10</sup> have taken histopathological examination as predictive factor for successful surgical spermatozoa retrieval. This factor has not been included in this study, as preliminary diagnostic testicular biopsy procedure is not done in our setup. Different areas of testes may have varying histology; single biopsy may not be a representative of whole testes and may miss areas of spermatogenesis.

In conclusion, our evaluation shows that the chance to successfully retrieving spermatozoa by TESE is 65% in men with normal FSH (cut off 14 IU/ml) and that FSH is a better predictor for surgical spermatozoa retrieval than the volume of the testis.

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## References

- 1) Sherman J, Silber MD. The Y chromosome in the era of intracytoplasmic sperm injection: a personal review. *Fertility and Sterility* 2011; 95(8): 2439-2448.
- 2) Jow WW, Steckel J, Schlegel PN, Magid MS and Goldstein M. Motile sperm in human testis biopsy specimens. *J. Androl.*, 1993; 14: 194-198.
- 3) Tournaye H, Verheyen G, Nagy P, Ubaldi F, Goossens A, Silber S, VanSteirteghem AC and Devroey P. Are there any predictive factors for successful testicular sperm recovery in azoospermic patients? *Hum. Reprod.*, 1997; 12: 80-86.
- 4) Ibrahim Fathi Ghalayini, Mohammed A. Al-Ghazo, Osama BaniHani, Rami Al-Azab, Ibrahim Bani-Hani, Faheem Zayed, Yazan Haddad. Clinical Comparison of Conventional Testicular sperm Extraction and Microdissection Techniques for Non-Obstructive Azoospermia *J Clin Med Res* 2011; 3(3): 124-131
- 5) Turunc T, Gul U, Haydardedeoglu B, Bal N, Kuzgunbay B, Peskircioglu L, Ozkardes H. Conventional testicular sperm extraction combined with the microdissection technique in nonobstructive azoospermic patients: a prospective comparative study. *FertilSteril* 2010; 94(6):2157-2160.
- 6) Ramasamy R, Lin K, Gosden LV, Rosenwaks Z, Palermo GD, Schlegel PN. High serum FSH levels

in men with non obstructive azoospermia does not affect success of microdissection testicular sperm extraction. *FertilSteril* 2009; 92(2): 590-593.

- 7) Hibi H, Ohori T, Yamada Y, Honda N, Asada Y. Probability of sperm recovery in non-obstructive azoospermic patients presenting with testes volume less than 10 ml/FSH level exceeding 20 mIU/ml. *Arch Androl* 2005; 51(3): 225-231.
- 8) Tsujimura A. Microdissection testicular sperm extraction: prediction, outcome, and complications. *Int J Urol* 2007; 14(10):883-889.
- 9) Colpi GM, Colpi EM, Piediferro G, Giacchetta D, Gazzano G, Castiglioni FM, Magli MC. Microsurgical TESE versus conventional TESE for ICSI in non obstructive azoospermia: a randomized controlled study. *Reprod Biomed Online* 2009; 18(3): 315-319.
- 10) Ezeh UIO, Taub NA, Moore HDM and Cooke ID Establishment of predictive variables associated with testicular sperm retrieval in men with non-obstructive azoospermia. *Human Reproduction* 1999; 14 (4): 1005-1012.

### Inhale Your Diabetes

Cigarette smoking has been implicated as a causative factor in so many human ailments. Can any new observation make cigarette smoke appear worse than it already is? According to a new study, you need not have to be a smoker to suffer the latest ill-effects attributed to cigarette smoke; you have to be just a passive inhaler. Those effects are Type 2 diabetes mellitus and obesity. For the study, Friedman and colleagues used data from a nationally representative sample of more than 6,300 adults who took part in the US National Health and Nutrition Examination Survey (NHANES) between 2001 and 2006. They used cotinine as biomarker for tobacco exposure. The study included 25% smokers (cotinine > 3 ng/mL), 45% non-smokers (cotinine < 0.05 ng/dL) and 34% secondhand smokers (cotinine > 0.05 ng/dL). After a careful analysis and adjusting for obesity, the investigators found that secondhand smokers had a higher rate of type 2 diabetes (haemoglobin A1c > 6.5%), almost the same rate as in smokers. The results were presented on 24/06/12 at the Endocrine Society's 94th Annual Meeting in Houston.

[<http://www.medicalnewstoday.com/articles/247110.php>]

- Dr. K. Ramesh Rao

# Review Article

## Drug Interaction – Cardiovascular Drugs

Dr. Ruckmani A

Professor of Pharmacology, Chettinad Hospital and Research Institute (CHRI), Kelambakkam, Tamil Nadu, India.



Dr.A. Ruckmani, graduated from Madurai Medical College, earned her Diploma in Dermatology from Madras University and M.D in Pharmacology from Dr.MGR Medical University. She has been teaching pharmacology from 1990 onwards. Her areas of research and interest include toxicology- snake bite poisoning, organo phosphorous poisoning, renal failure, anxiolytic & other CNS drugs, alternative systems of medicine and medical ethics. She received the INSA Fellowship award for the year 1999. She is currently Professor & Head, Dept. of Pharmacology, Chettinad Hospital & Research Institute.

Corresponding author - Dr. Ruckmani ([ruckmani.nirmal@gmail.com](mailto:ruckmani.nirmal@gmail.com))

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### Abstract

All the available drugs in one way or other help the recipient to ward off or cure a disease, but at the same time each drug carries simultaneously an unavoidable risk of causing certain adverse effects which may be tolerable or intolerable. The severity of adverse effect increases when many drugs are prescribed. Whether such combinations, intentional or unintentional, really benefit or harm the recipient, should be known to a prescriber. With this objective the present article reviews in detail the potential outcome of combination of cardiovascular drugs.

**Key Words:** Drug Interaction, Cardiovascular drugs, Anti hypertensives, statins

### Introduction

A drug when administered to a patient can interact with a) body, b) food, c) another drug, d) alcohol, e) tobacco taken simultaneously.

Interaction with the body is referred to as the "action of the drug" and the effect produced along with all other above mentioned agents is called "drug interaction". The outcome of such interaction may or may not be beneficial.

Broadly, drug interaction may be classified as general and specific.

### General Drug Interactions

#### 1. Drug – Food interactions

Food can delay or increase the absorption of the drugs or may not have any impact on absorption at all. The list of some of the cardiovascular drugs the absorption of which is altered by food is given in table 1<sup>1</sup>.

Grapefruit and many other citrus fruits having flavonoids like naringen & naringenin, furanocoumarins like dihydroxybergamotin inhibit intestinal CYP3A4 enzyme activity and hence the drugs that are metabolized by these enzymes will be elevated in plasma resulting in toxicity<sup>2</sup>.

Table 1: Effect of Food on absorption of drugs

Decreased	Delayed	Increased	Unaffected
Atenolol Sotalol Verapamil	Diltiazem Isosorbide-5-mononitrate Nicorandil Nifedipine	Amiodarone Nifedipine Ticlopidine	Amlodipine Bisoprolol Hydrochlorothiazide Metoprolol succinate

#### 2. Drugs & Alcohol

Drugs that inhibit aldehyde dehydrogenase such as Disulfiram will lead to accumulation of aldehyde intermediates which cause flushing, nausea, vomiting and sweating all of which can be dangerous in patients with coronary artery disease.

Isosorbide dinitrate and nitroglycerine will also cause such disulfiram-like reactions if they are taken along with alcohol. Moreover hypotension due to nitrates may be aggravated by the vasodilatory effect of alcohol.

Drugs such as aspirin, ranitidine and nizatidine inhibit pre-systemic metabolism of alcohol and may increase the total alcohol level in systemic circulation<sup>3</sup>. Therefore patients taking such medications should be advised not to drink alcohol.

Apart from disulfiram-like reactions, alcohol can also influence hepatic microsomal enzymes. Generally, acute alcohol intake will result in inhibition of these enzymes, whereas chronic intake will stimulate the enzyme activity. Acute alcohol intake may decrease warfarin metabolism and cause bleeding but chronic alcohol ingestion may increase warfarin metabolism and precipitate coagulation.

### 3. Tobacco – drug interactions

Tobacco contains polyaromatic hydrocarbons (PAH) and nicotine. PAH is in general a hepatic microsomal enzyme inducer, especially CYP1A2 substrates. Enzyme induction increases the metabolism of coadministered drugs and hence smokers require higher dosage.<sup>4</sup>

Nicotine can interact with beta blockers. The sympathetic stimulation of nicotine may blunt the action of beta blockers

### 4. Drug – Drug interactions

When a drug is given along with another drug three possible effects can occur apart from the desired pharmacological effect, for which the drugs are administered. One drug can increase or decrease or may not affect the response of another drug. When a drug increases or facilitates the action of the other drug it is called synergism. Drugs are combined intentionally to get the synergistic effect.

For example, when calcium channel blocker Amlodipine is given along with hydrochlorothiazide, hydrochlorothiazide increases the antihypertensive effect of Amlodipine by causing elimination of sodium and water. WHO recommends such scientific and rational combinations.

## Drug Interaction: Cardiovascular Drugs

The drugs prescribed for common cardiovascular diseases like hypertension, ischemic heart disease and congestive cardiac failure and arrhythmias are:

1. Diuretics
2. Sympathetic blockers
3. Calcium channel blockers
4. ACE inhibitors
5. Angiotensin receptor blockers
6. Nitrates
7. Anti platelet drugs
8. Hypolipidemic drugs
9. Digoxin
10. Adenosine

Most of the patients have concurrently other diseases such as diabetes, bronchial asthma and peptic ulcer. In such a situation in addition to cardiovascular drugs, antidiabetic, anti asthmatic and anti ulcer drugs have to be co prescribed. Hence, the number of drugs each patient has to take invariably will be more than 5. It is estimated that for patients taking 2-5 drugs daily the incidence of a potential drug interaction is 19%. This rises to over 80% for those taking 6 or more drugs.<sup>5</sup> It is reported that 20% of hospital admissions are due to drug - drug interactions<sup>6</sup>. The possible drug interactions that can occur with these groups of drugs can be any of the following:

### Diuretics:

Diuretics facilitate the effect of co administered antihypertensive drugs. In the process they also cause electrolyte and metabolic disturbances.

The most important electrolyte imbalance is hypokalemia especially with loop diuretics like furosemide. Digoxin also causes hypokalemia. A patient with congestive cardiac failure would be receiving digoxin and diuretic, both can increase hypokalemia resulting in arrhythmia. Hence hypokalemia should be watched for and ECG taken at timely intervals can help prevent hypokalemia, arrhythmia and muscle weakness.

It is well known that potassium sparing diuretics (spironolactone, triamterene and amiloride) when given with ACE inhibitors can result in hyperkalemia.

Though it is uncommon to use non-selective  $\beta$  blockers,  $\beta$  blockers can also cause hyperkalemia by decreasing the cellular uptake of potassium and decreasing aldosterone level. When given with potassium sparing diuretics the chance for hyperkalemia is increased.<sup>7</sup>

### $\beta$ blockers:

$\beta$  blockers like atenolol, metoprolol are combined with non-dihydropyridine calcium channel blockers like verapamil and diltiazem in the treatment of hypertension, ischemic heart disease and tachyarrhythmia. Both the groups of drugs decrease SA nodal and AV nodal activity and also inhibit myocardial contraction.

When a hypertensive patient is on antidepressant therapy, the antidepressant action can be blunted by  $\beta$  blockers which can enter the CNS (lipophilic drugs like propranolol and metoprolol).

When a patient is on anti diabetic drugs,  $\beta$  blockers including cardio-selectives can mask the warning signs and symptoms of hypoglycemia such as sweating, tachycardia and tremor. Hence  $\beta$  blockers should be used carefully in diabetics.

**$\alpha$  blockers:**

The anticipated side effect of  $\alpha$  blocker is hypotension. When the patient is on repeated use of a nasal decongestant, the  $\alpha$  agonist in the decongestant may decrease the action of  $\alpha$  blocker and BP may not decrease.

It is reported that  $\alpha_1$  blocker can cause fluid retention and if the patient is on either NSAID or steroid, fluid retention may be aggravated blunting the antihypertensive effect.

**Calcium channel blockers:**

The interaction between calcium channel blocker and  $\beta$  blocker has been discussed above. Amlodipine can cause pedal edema which can be reduced by the co administration of a thiazide diuretic like hydrochlorothiazide.

**ACE inhibitors: (ACEI)<sup>8</sup>**

Antacids may reduce the bioavailability of ACEI. It is well known that hyperkalemia can be caused due to simultaneous administration of ACE inhibitors and potassium sparing diuretics.

Some case reports link ACE inhibitors with the induction of lithium toxicity. Co administration of lithium should be undertaken with caution, and frequent monitoring of lithium concentration is recommended with all ACE inhibitors.

ACEI may increase the plasma level digoxin and lead to digoxin toxicity. Nonsteroidal anti-inflammatory drugs (NSAIDs) may attenuate the haemodynamic actions of ACE inhibitors and also they increase serum potassium as well as reduce the renal excretion of ACE inhibitors.

There is a little information available on the pharmacokinetic interaction with ACE inhibitors and cyclosporine, but caution should be exercised when they are used together.

Simultaneous administration of tetracycline with quinapril hydrochloride reduced the absorption of tetracycline by approximately 28% to 37%, possibly due to the high magnesium content in quinapril tablets. This interaction should be anticipated if quinapril hydrochloride is co prescribed with tetracycline or other drugs that interact with magnesium.<sup>9</sup>

The interaction between enalapril and glibenclamide has been studied by Rave K et al. They have reported higher incidence of hypoglycemic episodes in patients given both enalapril and glibenclamide/insulin. ACE inhibitors may cause a temporary increase in the insulin sensitivity, which can lead to an increased risk of hypoglycemia.<sup>10</sup>

**Angiotensin receptor blockers:**

ACE inhibitors and ARBs should not be combined as there is a risk of hypotension, hyperkalemia and renal failure. Renal parameters and electrolytes should be checked regularly.

**Nitrates:**

Nitrates can decrease the effect of sumatriptan and other triptans in migraine. The triptans cause vasoconstriction of cerebral blood vessels whereas nitrates cause vasodilatation. Hence when a patient takes both the drugs together nitrates may blunt the action of triptans.

**Digoxin interactions:**

Aminosalicylic acid such as mesalazine and antacids decreases the effect of cardiac glycosides due to decreased GI absorption of digoxin. Muscle relaxants may increase the muscle weakness and chance of cardiac arrhythmias due to hypokalemia. Erythromycin and tetracycline increase digoxin level in blood leading to toxicity.

Hepatic microsomal enzyme inducers like phenytoin and rifampin induce the metabolism of digoxin. Hence dosage adjustment has to be made when digoxin is given to patients on treatment for epilepsy or tuberculosis.

Digoxin clearance is decreased by verapamil, diltiazem, cyclosporine, itraconazole, quinidine, propafenone, and this may lead to digoxin toxicity. Corticosteroids may potentiate digitalis induced arrhythmias by causing hypokalemia.

**Statins:**

The major adverse effect of statins is myopathy. Concomitant use of drugs that diminish statins metabolism is associated with increased myopathy and rhabdomyolysis.

The most common interactions occurred with fibrates, especially with gemfibrozil, cyclosporine, digoxin, warfarin, macrolide antibiotics, mibefradil and azole antifungals. These interactions result in increased plasma concentrations of statins and their metabolites.<sup>11</sup> The dose of statins should not be more than 10-20 mg per day when the patient is on any microsomal enzyme inhibitor.<sup>12</sup>

Consuming grape fruit juice should be avoided during statin therapy. Statins, especially, fluvastatin may affect coumarin anticoagulation and increase the risk of haemorrhagic events. Patients who receive warfarin should have INR monitored before starting statins and regularly throughout treatment. However, as pravastatin is not metabolised by cytochrome P450, warfarin interaction is of less importance.<sup>12</sup>

Rosuvastatin is also not associated with cytochrome P450 interactions. But cyclosporine may be avoided with rosuvastatin. HIV protease inhibitors strongly increase exposure to rosuvastatin and are not recommended for combination use. Antacids reduce rosuvastatin plasma levels.<sup>12</sup> Statins and leflunomide when given together the hepatotoxicity may be aggravated hence should be given cautiously.<sup>13</sup>

### Cardiovascular drugs and herbal medicines:

Izzo A & Ernst E have reported that St John's wort (*Hypericum perforatum*) lowers blood concentrations of digoxin, warfarin, cyclosporine, amitriptyline, indinavir, and theophylline and reduce their efficacy. St John's wort can cause intermenstrual bleeding when taken with oral contraceptive pills.

Ginkgo (*Ginkgo biloba*) can interact with warfarin and cause bleeding and also blunt the action of thiazide diuretic.

Ginseng (*Panax ginseng*) lowers blood concentrations of alcohol and warfarin, and induces mania if used concomitantly with phenelzine.

Garlic (*Allium sativum*) can reduce the blood level of warfarin.

Thus interactions between herbal medicines and cardiovascular drugs can occur hence physicians should know about the use of herbal products by their patients and the possibility of herb-drug interactions.<sup>14</sup>

### Conclusion:

From this review it is evident that cardiovascular drugs will be lifesaving if combined wisely but if they are not rationally combined they can cause life threatening effects.

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### References:

- 1) Welling PG. Effects of food on drug absorption. *Annual Review of Nutrition*. 1996; 16: p.383-415
- 2) Junichi Azuma. Interaction between grapefruit juice and drugs. *Asian med. J.* 2001; 44(3): 136-141.
- 3) David W. Crabb Ron Weathermon. Alcohol Research & Health. Alcohol and Medication Interaction. 1999; 23 (1): 40-53
- 4) Lisa A. Kroon. Drug interactions with smoking. *Am J Health-Syst Pharm.* 2007; 64: 1917-21.

- 5) Gillies HC, Rogers HJ. In: Hodder & Staughton. 2nd Ed. *Textbook of Clinical Pharmacology*. London.1986:190-99
- 6) Brune, Kay. Incidence and costs of adverse drug reactions during hospitalization: computerized monitoring versus stimulated spontaneous reporting. *Drug safety*. 2000; 22(2): 161-169
- 7) Edwin K. Jackson. Renin and Angiotensin. In: Laurence L. Brunton, John S. Lazo and Keith L.Parker, 11th Ed. *Goodman & Gilman's The Pharmacological basis of Therapeutics*. USA, McGraw – Hill companies, Inc. 2005: 789-810
- 8) Thomas C. Westfall and David P. Westfall. In: Laurence L. Brunton, John S. Lazo and Keith L.Parker, 11th Ed. *Goodman & Gilman's The Pharmacological basis of Therapeutics*. USA, McGraw- Hill companies, Inc. 2005: 237-291
- 9) [www.drugs.com/pro/quinapril.html](http://www.drugs.com/pro/quinapril.html)
- 10) Rave K, Flesch S, Kühn-Velten WN, Hompesch BC, Heinemann L, Heise T. *Diabetes Metab Res Rev*. Enhancement of blood glucose lowering effect of a sulfonylurea when coadministered with an ACE inhibitor: results of a glucose-clamp study. *Profil Institute for Metabolic Research, Neuss, Germany*. 2005 Sep-Oct: 21(5):459-64.
- 11) Robert W. Mahley and Thomas P. Bersot. In: Laurence L. Brunton, John S. Lazo and Keith L.Parker, 11th Ed. *Goodman & Gilman's The Pharmacological basis of Therapeutics*. USA, McGraw- Hill companies, Inc. 2005: 933- 960
- 12) Statins: interactions, and updated advice for atorvastatin Drug Safety Update. MHRA January 2008; Vol 1, Issue 6: 2
- 13) FDA drug information -2003
- 14) Izzo AA, Ernst E. Interactions between herbal medicines and prescribed drugs: a systematic review. *Drugs*. 2001; 61(15):2163-75.

# Review Article

## Care of the Mechanically Ventilated Patient

### “Primum non nocere” “First, do no harm”

### “Envision a Healthcare system with no avoidable death and no avoidable harm”

Dr. Amarnath Moni, Assistant Professor, Department of Anaesthesiology, Chettinad Hospital and Research Institute, Kelambakkam, Tamil Nadu, India.



Dr. Amarnath is a Consultant Anaesthesiologist and Critical Care Physician currently working as Assistant Professor in Chettinad Academy of Research and Education. He also has an MBA in Hospital and Health Care Administration from the University of Northeast Virginia (USA), and does infrastructure and management consulting for some prominent healthcare organisations.

Corresponding author - Dr. Amarnath Moni ([moni.amarnath@gmail.com](mailto:moni.amarnath@gmail.com))  
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### Abstract

The care of the mechanically ventilated patient is a fundamental component of clinical practice in the intensive care unit (ICU). It is important that care of the mechanically ventilated patient in the ICU is well supported by evidence. Published work relating to the numerous issues of safety and care of the mechanically ventilated patient in the ICU is growing significantly, yet is fragmentary by nature. To establish the evidence supporting practice, a full review of current literature was undertaken using the following steps: Electronic search was done on MEDLINE, CINAHL, EMBASE and Psych-Review databases for articles published between 1970 and 2012. The purpose is to provide a single comprehensive examination of the evidence directly related to the safety and care of the mechanically ventilated patient.

**Key Words:** Mechanical Ventilation, Patient safety, Patient Assessment, Patient Comfort, Sedation and Pain Management

### Introduction

The science of medicine and its relevant medical technologies have never been so rapid and path breaking in its evolution as is witnessed today. The world as we know takes giant strides in creating technologies to cure or alleviate the suffering of mankind. Such gadgets often find their place in either diagnostics or intensive care. Healthcare professionals are often overwhelmed by this massive transfusion of technological advancement and the way it changes the outlook of medicine. While it is important to indulge and endure using these relevant technologies to improve the system of care, it is as important not to forget the basic concepts of human support like safety, comfort and psychosocial support, which help in the resolution of the disease. It is important to remember, that care in these dimensions took medicine to its defining moments in 19th century when care concepts in nursing care came to the fore. Modern day care has to be a combination of both. Pursuant to this concept, this article deliberates about the care concepts in the mechanically ventilated patient.

### Patient Safety

An essential strategy for promoting the safety of the mechanically ventilated patient is to use a health

assessment framework. The Emergency Care Cycle is one health assessment framework that facilitates a systematic and comprehensive approach to patient assessment. This framework has two components: the Primary survey (see Table 1) which identifies immediate life-threatening events, and the Secondary survey (see Table 2) which often utilizes a head-to-toe systems approach to assess the functional status of each body system<sup>1</sup>. The safety considerations in the care of the mechanically ventilated patient will be discussed using this framework.

Some general patient safety considerations are worth mentioning before we begin. Patients on mechanical ventilation in ICU require continuous observation and monitoring. For this reason a nurse/patient ratio of 1:1 is always recommended<sup>2</sup> (ACCCN, 2005). This ensures that the patient can be closely monitored and that the response to any alarms can be quick<sup>4</sup>. Promoting safety for the ventilated patient also involves keeping emergency equipment (see Table 3) available in the event of accidental extubation or ventilator failure<sup>5</sup>. Routine safety measures utilized when caring for any critically ill patient should apply for the same. These include checking intravenous infusions; ensuring the correct attachment of monitoring devices; checking patient equipment and suitable alarm settings.

Table 1 - Primary Survey

A: Airway	·	Listen to air movement Observe rise and fall of the chest Check tube is secure and length is correct
B: Breathing	·	Observe chest rise and fall Observe patient colour
C: Circulation	·	Check for pulse Observe patient colour
D: Disability		Level of consciousness
E: Exposure		Safety of the surroundings Preserving patient dignity

Table 2 - Secondary survey

System	Assesment Parameters
Central nervous system	Glasgow coma scale Sedation scale Level of neuromuscular block BIS score
Respiratory system	Airway device Tube position Cuff pressure monitoring Airway Patency Obstruction by secretions Check humidifier Breathing Respiratory pattern, frequency Adequacy of minute and tidal volume Blood gas analysis Finger tip pulse oximetry Capnography
Cardiovascular system	Chest X ray · Blood pressure · Pulse rate and rhythm · ECG CVP monitoring Plethysmography · Cardiac output monitoring DVT signs
Gastrointestinal system	· Presence of bowel sounds Abdominal girth Bowel sounds Examination of nasogastric tube aspirate Liver function tests and serum phosphate
General	Core body temperature Blood sugar levels Patient positioning and risk assessment for bed sores and ulcers
Renal system	Urine output Renal function tests

**Table 3 - Emergency equipment and safety checks**

Essential equipment at bedside
Self inflating manual resuscitation bag with appropriately sized face mask
High flow suction unit with yankeur sucker and endotracheal suction catheters
Additional equipment readily accessible at bedside
Intubation equipment
Oxygen-wall and portable supplies
Battery operated suction unit
Safety checks
All equipment is present, readily accessible and in full working order
The ventilator is connected where possible to an uninterrupted power supply
Intravenous infusions are being delivered according to a current order with the correct rate, composition, time of expiry, point of administration, etc.
Patient equipment is functioning properly and safe alarm limits are set
Monitoring devices are connected appropriately and safe alarm limits are set

## Patient Comfort

It is essential for critical care personnel to deliver high quality care to the critically ill patient using relevant technologies but equally important is incorporating psychosocial care measures<sup>5</sup>. This balance is often one of the largest challenges facing the persons involved in the critical care environment. A good foundation for standardized quality care would presume a thorough patient assessment and a comprehensive equipment safety check was undertaken. Following patient assessment and safety checks, consideration of crucial care interventions to improve patient comfort, safety and well being needs to be addressed. For this reason, physicians and nurses involved in critical care are expected to determine the unique interventions that will positively impact on outcome of the mechanically ventilated patient and assist in the patient's progression toward desired goals.

The advancement of patient comfort through focused procedural care interventions is an integral component of expert care in the ICU. The nature of critical care medicine brings a plethora of unique patient physiological and psychological challenges. A delicate balance is needed to shift between the skills required in the use of technical equipment and the caring role of the intensivist and nurse who use their ability to observe, protect, relate to their patients as valued people and provide care that is centered on comfort<sup>6</sup>. A humane approach to understand the patient's environment and the provision of comfort measures to minimize and, where possible, normalize the patient's routines go a long way to reducing the mechanically ventilated patient's psychological stress. This article emphasizes on several patient comfort measures including: positioning; eye care, mouth care and washing; management of stressors; sedation and pain management.

## Patient positioning

Positioning can improve patient comfort and also address the physiological aims of improving oxygen

transport (reducing V/Q mismatch), reducing the work of breathing and easing myocardial workload<sup>7</sup>. Specific examples include: supine, semi-recumbent, side lying and prone. There is a lot of evidence supporting the semi-recumbent positioning of ventilated patients, with the head of the bed (HOB) elevated from 30° to 45°, reducing the incidence of ventilator acquired pneumonia (VAP)<sup>8</sup>.

The degree of HOB and the time spent on supine position are identified risk factors for aspiration of gastric contents<sup>9</sup> and the development of VAP as a consequence. A seminal prospective, randomized, clinical trial conducted by Drakulovic et al.<sup>10</sup> compared continuous semi-recumbence (45° elevation) to no elevation in the early mechanical ventilation period and found a significantly greater incidence of VAP in patients without elevation of the head of the bed. Grap et al.<sup>11</sup> found that VAP was more likely to develop in patients with high Acute Physiology and Chronic Health Evaluation (APACHE) II scores who spent more time initially with the head of the bed less than 30°. Due diligence must be given to specific patient problems such as head injury and acute lung injury while considering elevation of HOB. In such circumstances, individual patient assessment should be done and practice guidelines should be based on related evidence.

## Mouth care

There appears to be a wide disparity in use of oral hygiene and comfort measures in the ventilated patient. Swabs (foam sticks) and toothbrushes are commonly used for mechanical cleansing while there is a variety in the choice of cleansing agents such as: commercial mouthwashes, chlorhexidine, hydrogen peroxide, sodium bicarbonate, and fluoride<sup>12</sup>. Evidence currently supports the use of a soft bristled toothbrush and rinsing of the oral cavity<sup>13</sup>. Stiefel et al.<sup>14</sup> compared the condition of the mucous membranes, teeth and tongue of eight ICU patients before and after tooth brushing and found that toothbrushes were effective in

improving oral hygiene. However, there is a limitation in this study; dental plaque variation was not reported nor was a link made to VAP.

Although chlorhexidine has been used in oral hygiene protocols for oncology patients<sup>15</sup> its efficacy has not been established in the critically ill patient population. However, it is noted to benefit adjunct plaque removal and suppress potential pathogenic organisms<sup>16</sup>.

Timing and frequency of oral care has been reported at 2, 3, 4 and 12 hourly intervals<sup>13</sup>. A review article by O'Reilly suggested that oral care at two and four hourly intervals improved oral health.<sup>12</sup> However, not providing oral care for extended periods reversed previous benefits. It is now recommended that oral care be established and maintained in individualized manner<sup>12</sup>.

## Hygiene

Effective nursing measures to meet the ventilated patients basic hygiene needs and to improve comfort are an integral part of expert critical care nursing practice.

## Eye care

Mechanically ventilated patients who are unconscious and/or sedated are a high-risk group dependent on eye care to maintain their eye integrity. These patients are at risk to develop abrasions, corneal dehydration and infection as a result of loss or impairment of basic eye protective measures, such as the blink reflex<sup>17</sup>. Individual assessment to determine eye care needs is essential in this group of patients. As per current practice, majority of ICU's perform eye care every 2 hours to prevent corneal abrasions, dehydration and infection. Methods of eye care include eye drops, taping, normal saline irrigation, paraffin-based gauze, ointments, gels and polyethylene<sup>17</sup>. One randomized controlled study found that polyethylene covers (cling wrap) are as effective as hypromellose drops and lacri-lube ointment in reducing the incidence of corneal damage in mechanically ventilated patients<sup>18</sup>. A systematic review recommends the following: eye care be provided to all ICU patients; ointments and drops are more effective in reducing corneal abrasion than treatment; and polyethylene covers are more effective in reducing corneal abrasion than ointment and drop<sup>19</sup>.

## Management of stressors

Significant focused research in the area of psychosocial care of the ventilated patient is happening over the past few decades. There is a recognized interface between the critical care environment and the patients experience of the stress. It has been reported that a considerable number of ventilated patients' experience sleep deprivation, nightmares, communication difficulties and feelings of isolation and loneliness.

## Communication stressors

Difficulties in communication are a source of great stress for mechanically ventilated patients, it often leads to feelings of vulnerability and powerlessness<sup>20,21</sup>. Ashworth's seminal observational

study of ICU nurse - patient communication interactions concluded that communication in the ICU occurred most frequently in conjunction with physical or procedural care. Recent literature suggests communication is focussed on care interventions and that nurses identify numerous barriers in communicating with the mechanically ventilated patients under their care. These include: heavy workload; focus on technological or physical care<sup>22</sup>; difficulty in lip reading; patients inability to write; patient personality<sup>23</sup>; and lack of education regarding communication. Despite the general belief that communication<sup>20</sup> with mechanically ventilated patients is an important aspect and an integral part of quality care, evidence still suggests that communication is neither effectively nor consistently managed<sup>24</sup>. Though communication with the mechanically ventilated patient is a challenging aspect of nursing care there are behaviors and devices, which can assist in the process. The intensivist and nurse's use of positive body language, friendly gestures, eye contact and use of simple questions with a yes/no response has been reported to reduce patient distress<sup>23</sup>. Other useful strategies reported include, the involvement of familiar people, such as family members, and the use of specific staff who are familiar with the patient<sup>21</sup>. Lip reading and pen and paper are still the most commonly used communication tools. Other devices suggested are word or picture charts, alphabet boards and rewritable magnetic boards.

## Sleep disturbance

Sleep disturbance is a significant problem and a significant stressor for mechanically ventilated patients in the ICU. Critically ill patients have reported high incidence of fragmented sleep<sup>25</sup>. There is profound debate in the literature in regard to sedation in the ventilated patient; whether it is a solution or part of the problem<sup>26</sup>. Active promotion of sleep is not always possible in the unstable critically ill patient; nurses have to individualize care for each patient by planning sleep promoting interventions. The common causes include; environmental noise (including alarms, equipment, telephones and talking), lighting, discomfort, stress and pain<sup>26</sup>. Sleep deprivation can as a consequence produce; suppression of the immune system leading to an impaired capacity to combat infection and impaired wound healing; weak upper airway musculature and delayed weaning from mechanical ventilation<sup>26</sup>. Further, visual hallucinations and delirium can result.<sup>27</sup> Preparing the ventilated patient for sleep can be a challenge for the critical care staff. It is often recommended that critical care personnel should reduce environmental noise and cluster care into short episodes to enable periods of uninterrupted rest for the patient<sup>25</sup>. Many studies recommend the following care interventions: timely silencing of equipment alarms; pre-emptive silencing of ventilator alarms prior to suctioning; dimmed lighting; minimizing lights turned on at night; positioning the patient comfortably; considering the ICU room temperature; clustering of care, where possible, to promote periods of uninterrupted sleep; avoiding care interventions that

are commonly performed at night as part of their practice routines (for example; patient bedcare between 2 and 4 a.m. or ECG recording at 5 a.m.)<sup>26</sup> The implementation of such care is based policy and expert ICU care, recognizing that it is an important pre-requisite to promote the re-establishment of the ventilated patients diurnal rhythms.

### Feelings of isolation and loneliness

Hupcey undertook a study of 45 critically ill adult patients who were in ICU for a minimum of three days and found that the ventilated patients need to feel safe is paramount.<sup>28</sup> Feelings of isolation, loneliness, and fear and anxiety have a negative impact on patient perceptions of safety.

Critical care personnel can use numerous interventions to reduce patients' perception of isolation and loneliness. Orientation with respect to day and time can be achieved through repeated communication and large clocks which faces in view for the patient. Placing objects familiar to the patient, such as family pictures, around the bed space can personalize the ICU environment. For long-term mechanically ventilated patients, planning their day with "trips to the outside" is another mechanism to reduce isolation. The authors emphasize that though the impact on workload from this intervention is huge, the positive benefits of such a practice to patient and staff is substantial.

It is accepted that families have a positive impact on the patient's outcome in the ICU<sup>29</sup>. Stressors such as social isolation and others in the ICU may contribute to ventilated patients sense of dependency and increase acute confusion and distress<sup>30</sup>. Evidence suggests that, social interaction, in the form of family presence, can be beneficial to the mechanically ventilated patient<sup>31</sup>. Family-centric approach is a philosophy of care that acknowledges the family unit as the fundamental focus of all health care interventions<sup>32</sup>. In the ICU this translates to, the consideration of the mechanically ventilated patient in the context of their family and the assessment of individual family needs to plan and implement the interventions necessary to improve outcomes for patients and their families. Measures such as encouraging the family to be with the patient, communicating to the patient and holding their hand are of great benefit to the patient and family.

### Pain management

Patients recalling experience to pain during their time in intensive care are almost everywhere<sup>39</sup>. Furthermore, nurses underestimate patients pain<sup>34</sup>. Pain has many deleterious effects; therefore it is imperative to view pain as the fifth vital sign when undertaking assessment<sup>38</sup>.

It is widely accepted in practice that an individual's self-report of pain is the most accurate<sup>33</sup> (ANZCA, 2005). In many mechanically ventilated patients it is not possible to verbalize because of endotracheal intubation, and there is significant impairment of non-verbal communication caused by such factors as sedation<sup>34</sup>. Therefore, tools selected should be

appropriate to the individual, and all methods deemed likely to gather the required information should be used<sup>35</sup> (ANZCA, 2005). Methods include the use of assessment tools, and behavioral and physiological signs<sup>35</sup>. Several assessment tools have been used for critically ill patients, though there is limited validation of tools in this population. Tools for the assessment in intensity of pain include the visual analogue scale and the numeric rating scale<sup>34</sup>. Tools developed specifically for critically ill patients and requiring further validation include the adult non-verbal pain scale<sup>36</sup>, pain assessment and intervention notation tool<sup>35</sup>, both use behavioural and physiological data and the behavioral pain scale<sup>37</sup>.

Both behavioral and physiological indicators may inform pain assessment of the mechanically ventilated patient. Physiological indicators are the least reliable in this regard. Significant pain may be present with no change in behavioral or physiological parameters<sup>35</sup>. Other factors, which may contribute to pain assessment, include the presence of wounds, procedures to be undertaken, and proxy assessment data from family members, poorly correlated with self-reports<sup>36</sup>. An analgesia plan with clear objectives needs to be established and communicated to all care providers<sup>34</sup>. Documentation is vital for effective communication and optimal management of pain; so, pain assessment and response to interventions must be clearly documented<sup>38</sup>.

### Sedation Management

Pain management and sedation are bonded inextricably<sup>40</sup>. Continuous iv sedation prolongs mechanical ventilation time<sup>41</sup>. Daily sedation vacations to reassess requirements reduce ventilation time, length in intensive care and complications such as VAP<sup>42</sup>. Likewise, the use of protocols/guidelines with clear goals has demonstrated a reduction in ventilation time, medication side effects, morbidity, length of stay in ICU and costs<sup>43</sup>. Therefore, protocols incorporating daily sedation vacations should be used.

Pain and other correctable causes of distress need to be addressed prior to meeting sedation requirements. Commonly used in clinical practice, the Ramsay Scale is a six-point numerical scale of motor response derived on the basis of depth of sedation<sup>44</sup>. There is limitation in discrimination of quality and degree of sedation<sup>34</sup>. The Riker Sedation-Agitation Scale (SAS) is a seven-point scale that illustrates behaviour from unrousable through to dangerous agitation<sup>45</sup>. The Richmond Agitation-Sedation Scale (RASS) is a 10-point scale that illustrates patient behaviour from unrousable to combative<sup>46</sup>. Both the SAS and RASS have been validated in critical care populations. Both uses tools such as observation, response to voice; and if no response to voice, response to physical stimulation<sup>34</sup>. Many tools have been developed for critical care populations, but probably the best is yet to come<sup>46</sup>. Apart from this, tools such as Minnesota Sedation Assessment Tool, Adaptation to the Intensive Care, Motor Activity Assessment Scale, Adaptation to the Intensive Care Environment instrument and the Vancouver Interactive and Calmness Scale are used in some centers<sup>46</sup>.

## The Ventilator Care Bundle

The Institute of Healthcare Improvement<sup>46</sup> (IHI) has come up with this very significant initiative. The IHI Ventilator Bundle is a series of interventions related to ventilator care that, when implemented together, will achieve significantly better outcomes than when implemented individually.

The key components of the IHI Ventilator Bundle are:

1. Elevation of the Head of the Bed
2. Daily "Sedation Vacations" and Assessment of Readiness to Extubate
3. Peptic Ulcer Disease Prophylaxis
4. Deep Venous Thrombosis Prophylaxis
5. Daily Oral Care with Chlorhexidine

By using these series of interventions, the most lethal and among the most common of all hospital-associated infections — dropped by more than 70 percent. The findings, published online in the journal *Infection Control and Hospital Epidemiology*, show how a relatively simple series of steps, coupled with an education program and a work environment that promotes patient safety, can save tens of thousands of lives and millions of dollars in health care costs.

Such pneumonias kill an estimated 36,000 Americans each year. There is no near exact figure for India, but I guess it must be reasonably higher. "Far too many patients continue to suffer preventable harm from these respirator-linked pneumonias," says study lead author Sean M. Berenholtz from the Johns Hopkins University School of Medicine. "Health care organizations need to be held accountable for ensuring that patients get safe and effective treatments to prevent these infections. Broad use of this intervention could prevent the vast majority of those 36,000 deaths."

## ICU Process Measures

### Head of bed elevation

Bottom Line: In mechanically ventilated patients, HOB elevation > 30 degrees reduces the frequency and risk for nosocomial pneumonia compared to supine position. Elevating HOB > 30 degrees is a simple no cost intervention that will improve outcomes in our patients.

### Appropriate DVT prophylaxis

Bottom Line: In critically ill patients, thromboprophylaxis is effective for preventing deep venous thrombosis (DVT). However, the method of prophylaxis proven in one group cannot necessarily generalize to other patients, and multiple types of thromboprophylaxis appear to be effective. Nonetheless there is agreement that patients who are critically ill or mechanically ventilated are at high risk for DVT and should receive thromboprophylaxis.

### Appropriate PUD prophylaxis

Bottom Line: In mechanically ventilated patients, the use of PUD prophylaxis reduces the risk of upper

GI bleeding. The specific therapy may be less important. Multiple therapies for PUD prophylaxis are effective.

### Appropriate sedation

Bottom Line: Daily interruptions of sedative drug infusions decrease the duration of mechanical ventilation and length of stay in the ICU.

### Appropriate glucose control

Bottom Line: Intensive insulin therapy to maintain blood glucose <110 mg per deciliter reduces morbidity and mortality among the critically ill patients.

### Assessment of readiness to extubate

Bottom Line: Daily screening of the respiratory function followed by trials of spontaneous breathing can reduce the duration of mechanical ventilation, and decrease complications and costs of ICU care.

## Summary

The mechanically ventilated patient presents many challenges to the intensivist. Care and management of the critically ill mechanically ventilated patient is demanding and necessitates an expert understanding of technological issues underpinned with a patient focused approach. From the discussion above it is clear that while mechanical ventilation is a necessary therapeutic intervention for many patients, it brings with it an array of potential or actual complications that present further challenges for the critically ill patient. It is evident that there are many areas of care that would benefit from further research. Future research should determine the most effective strategies to provide comfort to the patient through alleviation of common stressors such as communication issues, sleep disturbance, isolation, and pain and sedation management.

To support the use of evidence in the practice, the concept of a 'Ventilator Care Bundle' had been utilized in the United States and the United Kingdom. The bundle includes four interventions which have sound evidence to support their effectiveness in improving outcomes for the mechanically ventilated patient: elevation of the head of the bed; management of sedation including daily 'sedation vacations'; peptic ulcer prophylaxis; deep vein thrombosis prophylaxis<sup>46</sup> (Institute for Healthcare, in press). The concept of Care Bundles provides a mechanism for highlighting best practice in a particular area to clinicians. If implemented effectively, Care Bundles support the provision of minimum standards of care for all patients in a subgroup<sup>47</sup> and provide indicators to measure the quality of care provided<sup>48</sup>. The utilization of a care bundle for the ventilated patient could also serve as a quality improvement process and a mechanism of ensuring evidenced-based practice<sup>49</sup>.

## References:

- 1) Nettina SM, editor. Lippincott manual of nursing practice. 8th ed. Philadelphia: Lippincott, Williams and Wilkins; 2006.
- 2) ACCCN. Position statement on intensive care nursing staffing. Australian College of Critical Care Nurses; 2005, Available: [www.acccn.com.au](http://www.acccn.com.au).
- 3) Winters A, Munro N. Assessment of the mechanically ventilated patient: an advanced practice approach. *AACN Clin Issues* 2004;15(4):525—33.
- 4) Yeh S, Lee L, Ho T, Chiang M, Lin L. Implications of nursing care in the occurrence and consequences of unplanned extubation in adult intensive care units. *Int J Nurs Stud* 2004;41(3):255—62.
- 5) Urden L. Critical care nursing practice. In: Urden L, Stacy K, Lough M, editors. *Thelan's critical care nursing: diagnosis and management*. Philadelphia: Mosby Elsevier; 2006. p. 3—13.
- 6) Clifford C. Patients, relatives and nurses in a technological environment. *Intensive Care Nurs* 1986;2:67—72.
- 7) Stiller K. Physiotherapy in intensive care: towards evidence based practice. *Chest* 2000;118(6):1801—13.
- 8) Bonten MJ. Prevention of hospital acquired pneumonia: European perspective. *Infect Dis Clin N Am* 2005;17(4):773—84.
- 9) Torres A, Serra-Batlles J, Ros E, Piera C, Puig de la Bellacasa J, Cobos A, et al. Pulmonary aspiration of gastric contents in patients receiving mechanical ventilation: the effect of body position. *Ann Intern Med* 1992;116(7):540—3.
- 10) Drakulovic MB, Torres A, Bauer T, Nicolas J, Nogue S, Ferrer M. Supine body position as a risk factor for nosocomial pneumonia in mechanically ventilated patients: a randomised trial. *Lancet* 1999;354:1851—8.
- 11) Grap MJ, Munro C, Hummel R, Elswick R, McKinney J, Sessler C. Effect of backrest elevation on the development of ventilator-associated pneumonia. *Am J Crit Care* 2005;14(4): 325—33.
- 12) O'Reilly M. Oral care of the critically ill: a review of literature and guidelines for practice. *Aust Crit Care* 2003;16(3): 101—10.
- 13) Munro C, Grap MJ. Oral health and care in the intensive care unit: state of the science. *Am J Crit Care* 2004;13(1):25—33.
- 14) Stiefel KA, Damron S, Sowers NJ, Velez L. Improving oral hygiene for the seriously ill patient: implementing research-based practice. *Med Surg Nurs* 2000;9:40—3, 46.
- 15) Dodd MJ, Dibble SL, Miaskowski C, MacPhail L, Greenspan D, Paul S, et al. Randomised clinical trial of the effectiveness of 3 commonly used mouthwashes to treat chemotherapy induced mucositis. *Oral Surg Oral Med Oral Pathol Oral Radiol* 2000;90:39—47.
- 16) Houston S, Hougland P, Anderson JJ, LaRocco M, Kennedy V, Gentry LO. Effectiveness of 0.12% chlorhexidine gluconate oral rinse in reducing prevalence of nosocomial pneumonia in patients undergoing heart surgery. *Am J Crit Care* 2002;11(6):567—70.
- 17) Dawson D. Development of a new eye care guideline for critically ill patients. *Intensive Crit Care Nurs* 2005;21:119—22.
- 18) Koroloff N, Boots R, Lipman J, Thomas P, Rickard C, Coyer F. A randomised controlled study of the efficacy of hypromellose and Lacri-Lube combination versus polyethylene/Cling wrap to prevent corneal breakdown in the semiconscious intensive care patient. *Intensive Care Med* 2004;30:1122—6.
- 19) Best practice: evidence based practice information sheets for health professionals. Eye care for intensive care patients, vol. 6(1). The Joanna Briggs Institute for Evidenced Based Nursing and Midwifery; 2002. p. 1—6.
- 20) Happ MB. Communicating with mechanically ventilated patients: state of the science. *AACN Clin Issues* 2001;12(2):247—58.
- 21) Magnus VS, Turkington L. Communication interaction in ICU patient and staff experiences and perceptions. *Intensive Crit Care Nurs*, in press.
- 22) Fox S, Jeffrey J. The role of the nurse with families of patients in ICU: the nurses' perspective. *Can J Cardiovasc Nurs* 1997;8(1):17—23.
- 23) Leathart AJ. Communication and socialisation (2): perceptions of neophyte ICU nurses. *Intensive Crit Care Nurs* 1994;10:142—54.
- 24) Moser DK, Misook LC, McKinley S, Reigel B, Kyungh A, Cherrington CC, et al. Critical care nursing practice regarding patient anxiety assessment and management. *Intensive Crit Care Nurs* 2003;19:276—88.
- 25) Tamburri LM, DiBrienza R, Zozula R, Redeker NS, Johnson RW. Nocturnal care interactions with patients in critical care units. *Am J Crit Care* 2004;13(2):102—12.

- 26) Honkus V. Sleep deprivation in critical care units. *Crit Care Nurs Q* 2003;26(3):179—89.
- 27) Ramful A. Psychological disturbances caused by sleep deprivation in intensive care patients. *Br J Anaesth Recovery Nurs* 2005;6(4):63—7.
- 28) Hupcey JE. Feeling safe: the psychosocial needs of ICU patients. *J Nurs Scholarship* 2000;32:361—7.
- 29) Powers P, Goldstein C. The value of patient- and family-centered care. *Am J Nurs* 2000;100(5):84—8.
- 30) Jones C, Griffiths R, Humphries G. Disturbed memory and amnesia related to intensive care. *Memory* 2000;8(2):79—94.
- 31) Bizek K. The patient's experience with critical illness. In: Morton PG, Fontaine DK, Hudak CM, Gallo BM, editors. *Critical care nursing: a holistic approach*. 8th ed. Philadelphia: Lippincott Williams & Wilkins; 2005. p. 12—26.
- 32) Wright M, Leahey M. *Nurses and families: a guide to family assessment and intervention*. 2nd ed. Philadelphia: FA Davis Co.; 1994.
- 33) Australian and New Zealand College of Anaesthetists (ANZCA) and Faculty of Pain Medicine. *Acute pain management: scientific evidence*. 2nd ed. Australian Government National Health and Medical Research Council; 2005.
- 34) Jacobi J, Fraser GL, Coursin DB, Riker RR, Fontaine D, Wittbrodt ET, et al. Clinical practice guidelines for the sustained use of sedatives and analgesics in the critically ill adult. *Crit Care Med* 2002;30(1):119—41.
- 35) Puntillo K. Pain assessment and management in the critically ill: wizardry or science. *Am J Crit Care* 2003;12(4):310—6.
- 36) Odhner M, Wegman D, Freeland N, Steinmetz A, Ingersoll GL. Assessing pain control in nonverbal critically ill adults. *Dimensions Crit Care Nurs* 2003;22(6):260—7.
- 37) Payen J-F, Bru O, Bosson J-L, Lagrasta A, Novel E, Deschaux I, et al. Assessing pain in critically ill sedated patients by using a behavioural pain scale. *Crit Care Med* 2001;29(12):2258—63.
- 38) Shannon K, Bucknell T. Pain assessment in critical care: what have we learnt from research. *Intensive Crit Care Nurs* 2003;19(3):154—62.
- 39) Hogarth DK, Hall J. Management of sedation in mechanically ventilated patients. *Curr Opin Crit Care* 2004;10(1):40—6.
- 40) Park G, Coursin D, Ely EW, England M, Fraser GL, Mantz J, et al. Balancing sedation and analgesia in the critically ill. *Crit Care Clin* 2001;17(4):1015—27.
- 41) Kollef MH, Levy NT, Ahrens TS, Schaiff R, Prentice D, Sherman G. The use of continuous IV sedation is associated with prolongation of mechanical ventilation. *Chest* 1998;114(2):541—8.
- 42) Kress JP, Pohlman AS, O'Connor MF, Hall JB. Daily interruption of sedative infusions in critically ill patients undergoing mechanical ventilation. *N Engl J Med* 2000;342(20):1471—7.
- 43) Ibrahim EH, Kollef MH. Using protocols to improve the outcomes of mechanically ventilated patients. *Crit Care Clin* 2001;17(4):989—1001.
- 44) Ramsay MAE, Savege TM, Simpson BRJ, Goodwin R. Controlled sedation with alfaxalone-alphadolone. *Br Med J* 1974;2:656—9.
- 45) Riker RR, Pickard JT, Fraser GL. Prospective evaluation of the sedation-agitation scale for adult critically ill patients. *Crit Care Med* 1999;27(7):1325—9.
- 46) Institute for Healthcare Improvement. Implement the ventilator bundle. <http://www.ihi.org/IHI/Topics/CriticalCare/IntensiveCare/Changes/ImplementtheVentilatorCareBundle.htm>; [retrieved 3rd July 2006].
- 47) Resar R, Pronovost P, Haraden C, Simmonds T, Rainey T, Nolan T. Using a bundle approach to improve ventilator care processes and reduce ventilator-associated pneumonia. *Joint Commission J Qual Patient Saf* 2005;31(5):243—8.
- 48) Pronovost PJ, Berenholtz SM, Ngo K, McDowell M, Holzmueller C, Haraden C, et al. Developing and pilot testing quality indicators in the intensive care unit. *J Crit Care* 2003;18(3):145—55.
- 49) Fulbrook P, Mooney S. Care bundles in critical care: a practical approach to evidence-based practice. *Nurs Crit Care* 2003;8(6):249—55.

# Case Report

## The Missing Link - Medico - Legal Aspect of Communication

Dr.S.Janani, Senior Resident, Forensic Medicine, JPNATC, AIIMS, New Delhi



Dr.S.Janani graduated from Madras Medical College, Chennai in 2006 and joined Masters in Forensic Medicine at Sawai Mansingh Medical College, Jaipur. Currently she is working as Senior Resident in the Department of Forensic Medicine and toxicology at Jai Prakash Narayna Apex Trauma Centre (JPNATC), AIIMS, New Delhi.

Corresponding author - Dr. S.Janani (janyraj@gmail.com)  
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### Introduction

There is an increasing disagreement and dissatisfaction among common public regarding the current status of health care. With an exponential increase in the number of malpractice lawsuits, the trend is shifting towards the practice of defensive medicine. In an attempt to protect oneself from defamation and harassment, the health care providers anticipate problems and act to prevent them. Amidst the advancements and sophistication of medical practices, at times the very basic component of a physician patient relationship is being overlooked: communication. While effective communication brings down the stress levels of patients and relatives, a healthier and timely discussion might protect a practitioner against malpractice allegations. The present case is an example of how a doctor patient/ relative discussion could have avoided unnecessary legal and emotional hassles for the relatives of the patient and the investigating authority.

**Key Words:** Doctor, Patient communication, medico – legal, malpractice lawsuits.

### Case Report

A thirty year old man was brought to the hospital in altered sensorium by his room mates. The patient allegedly belonged to another state and lived in his rented room with his co workers from his home town. The patient was a daily wager and habitual alcoholic. In the evening of the fateful day, after his routine of alcohol and dinner, he started climbing down the stairs from the third floor, when he stumbled and fell on the floor. There were eyewitnesses from the neighbouring balconies who raised an alarm and brought him to hospital. After initial examination, he was admitted in the Neurosurgery department. CT scan showed left side Subdural hematoma with midline shift and left frontotemporal contusions. As there were no immediate relatives who lived nearby, the patient was operated with permission from the Medical Superintendent of the hospital as per 'Loco parentis'. After the procedure, the patient was shifted to the ICU in the intubated state. He never regained consciousness to give his statement to the relatives or to the investigating agencies. Meanwhile, after two days his siblings had arrived from his hometown and started taking care of him. They only knew what they had heard that their brother had sustained injury and is under treatment. Lack of communication from the doctors on rounds and the paramedical staff as to the procedure that had been performed on the injured already in their absence, lead to their conspiring theories as to how their brother sustained the injury. When the para medical staff removed the drain tube from his craniotomy wound, the brothers saw the left frontotemporo parietal 'C' shaped surgical wound and

assumed it to be caused by a weapon and decided it to be a case of homicide.

After a few days, the injured succumbed to his injuries and its complications and was brought to the mortuary for an autopsy where the relatives started protesting that it was a case of homicide and that the police had taken bribe from the accused for letting him go and made it into a case of accidental fall from height. There was huge hue and cry from the relatives and public, and having the tainted reputation, the police were subjected to media criticism. At the time of autopsy, the police and the relatives cornered the autopsy surgeon and both gave their versions of the incident. The police having eyewitnesses who had given written statements gave their version, and the relatives based on their suspicion, theirs. While asked the basis of their suspicion the relatives mentioned the large wound they had seen on their brother's head. With great efforts they were explained that the deceased had undergone a surgical procedure before their arrival and were shown the wound before starting autopsy. They were further advised that if they had suspicions other than that, they should register a formal complaint, stating their suspects rather than raising slogans and creating public nuisance. Though eventually there was no complaint or proceedings in the case, the incident brought to notice the lack of adequate communication between the health care providers and patients' relatives. Public demonstrations, mental and emotional anguish of the relatives were preventable events. Allegations could have misled the investigating authority with conviction of an innocent. The medical, emotional and medico legal outcomes of effective patient doctor communication are discussed in this article.

## Discussion

The very basis of medical consultation is the physician patient relationship. Though it has been described in the first few chapters of medical text books, very few give importance to them. Students prefer to learn directly history taking and examinations which are considered more fruitful topics and the present teaching is also diagnosis and management oriented rather than being communication oriented. In the chaos of coming to a correct diagnosis and treating the disease, the patient is being ignored as a person. In the era of specialization and super specialization, the patient is dissected and is being treated as a system rather than as a whole. This has gradually led to disharmony and dissatisfaction among the patients and relatives. Though great efforts are being taken by the health care professionals to care for the patients among their busy schedules, most of the time the patients end up feeling dissatisfied. Many of the patients complain that the duration of consultation was inadequate and that the consultation was hurried. Physicians commonly redirect and focus clinical interviews on issues they consider important before giving patients even the opportunity to complete their statement of concerns.<sup>1</sup> A whole lot of this scenario can be changed by a healthy communication. In the present scenario of getting an informed written consent, patients expect a doctor to give full information regarding their medical conditions and willfully participate in the decision making regarding their treatment options.

The ultimate objective of any doctor-patient communication is to improve the patients health and medical care<sup>2</sup>. The main goals of current doctor-patient communication are to create a good interpersonal relationship, facilitate exchange of information, and to include patients in decision making<sup>3</sup>. It has been observed that communication skills tend to decline as medical students progress through their medical education, and over time doctors in training tend to lose their focus on holistic patient care<sup>4</sup>. Patients want doctors who can skillfully diagnose and treat their sicknesses as well as communicate with them effectively<sup>4</sup>.

It is important that communicating to the guardian or caretaker of the patient also plays a vital component of a physician patient relationship. A healthy and effective doctor patient relationship not only enhances the health and emotional well being of the patient, it also improves patient compliance to treatment and follow ups.<sup>5</sup> The newly proposed curriculum of undergraduate medicine, where emphasis is made on communication skills, will be a good start to improve the present scenario.<sup>6</sup> A foundation course has been proposed wherein the student shall be trained to enhance skills of interpersonal relationships, communication, self directed learning, time and stress management. Also every health care professional is expected to follow and practice medical ethics for the betterment of the society at large.

## References:

- 1) Swaminath G. Doctor patient communication. Patient perception Indian Journal of Psychiatry 2007; Vol 49(3):150-3.
- 2) Duffy FD, Gordon GH, Whelan G, et al. Assessing competence in communication and interpersonal skills: the Kalamazoo II report. Acad Med. 2004;79(6):495-507.
- 3) Ha JF, Longnecker N. Doctor patient communication:A review. The Oschner Journal 2010; 10(1):38-43.
- 4) DiMatteo MR. The role of the physician in the emerging health care environment. West J Med. 1998;168(5):328-333
- 5) Wong YS S, Lee A. Communication skills and doctor patient relationship. Hong Kong Medical Diary 2006; Vol 11(3):7-9.
- 6) Regulations on Graduate Medical Education, 2012, Medical Council of India, www.mciindia.org

# Case Report

## Management of Persistent Non Nutritive Sucking Habit

Dr Daya Srinivasan<sup>1</sup>, Dr Senthil Aegappan A.R.<sup>2</sup>, Dr Joe Louis C<sup>3</sup>

<sup>1,2</sup> Lecturer, <sup>3</sup> - Professor and Head of Department, Department of Pedodontia and Preventive Dentistry, Chettinad Dental College and Research Institute (CDCRI), Kelambakkam, Tamil Nadu, India.



Dr Daya Srinivasan M.D.S is working as a Lecturer in Chettinad Dental College for the past four years. She did her Bachelors and Masters in Pedodontia and Preventive Dentistry from Ragas Dental College. She has presented many scientific papers and has publications. Her areas of interest include preventive dental health, pulp tissue regeneration. She has actively participated in various schools dental health programmes. She handles the dental need of the children, adolescents and special children.

Corresponding author - Dr. Daya Srinivasan (dayaswathi@gmail.com)  
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### Abstract

Thumb sucking is a common habit among younger children. Usually, the child outgrows this habit by age 2.5-3 years. When a child continues to suck his or her thumb, it can be a cause of potential harm due to peer pressure, ridicule, and shunning. It can also lead to malocclusions. Early detection and appropriate intervention can help in correcting the habit and malocclusion and preventing an orthodontic treatment at a later stage. We are reporting a case of thumb sucking where intervention was done and malocclusion corrected during the growing phase of the child.

**Key Words:** Crib appliance, Interceptive, Malocclusion, Thumb sucking.

### Introduction

Thumb sucking is a form of non nutritive sucking occurring as early as the 29<sup>th</sup> week of gestation. It is seen commonly in infants and peaks at 18-21 months of age. The habit is normal in the first 2-3 years of life. Continuance of habit may cause permanent damage to developing dentition.<sup>1</sup>

Sigmund Freud theory relates finger sucking to the oral phase of child development. If gratification is not complete, and sucking continues beyond the oral phase of child development it leads to fixation. Digit sucking at a later stage is usually considered a sign of regression. Both fixation and regression are the signs of emotional disturbance.

The learned behavior theory stems from an adaptive response and suggests that sucking is an innate urge in infants and that finger sucking is an outlet for an excess sucking urge. When feeding is quickly and efficiently satisfied, the excess sucking urge is expressed as non nutritive sucking.<sup>2</sup> Digit-sucking habit decreases with age and most children abandon this activity by 3.5-4 years of age. On occasion, individuals may continue to exhibit a digit habit throughout childhood and even into the adult years.

Prevalence seems to be influenced by many factors such as sex, birth rank, feeding method, and socioeconomic status. Numerous studies in the dental literature report on the prevalence of digit sucking. The results differ from 1.7% to 47.0%, and many of these investigations report thumb sucking as the most common oral habit.<sup>3, 4, 5, 6.</sup>

The prevalence study of thumb sucking carried out on 3-12-year old, 2517 children (1293 boys and 1224 girls), with different socio-economic status, belonging to villages, suburbs and city areas of Calcutta revealed that non-nutritional sucking habit was predominantly seen in cities, and bottle feeding was found to be the main cause of this habit; in 3-6-year-old children the prevalence of the habit was more in boys than girls but it persisted more in boys with increase in age.<sup>7</sup>

Prolonged digit sucking habit may affect the occlusion and dentofacial structures. Frequency and duration of the habit, intensity of the sucking, relationship of the dental arches and the child's state of health are the factors effective in the development of dental and skeletal problems.

### Case Report

A 7 year old girl reported to our Department of Pedodontia with complaint of space in her front teeth. On History it was revealed that she was a thumb sucker, puts her thumb for at least 6-7 hours a day. The habit was present from infancy. The habit was present only at home, not at school. She had a younger brother who was 4.5 years old who did not suck his fingers. Parents tried ridiculing; shaming the child, applying neem juice extract to her thumb but the child was persistent with the habit. On examination it was found that the child was in mixed dentition period, Class I molar occlusion with anterior open bite, spacing between upper anterior teeth, associated with tongue thrust habit, no posterior cross bite. (Figure1)



Fig 1- Pre operative

The child was found that she wanted to leave the habit but was unable to do so. Treatment plan was to give her fixed habit breaking appliance. Upper and lower impression was made after adapting the bands in upper permanent first molar. Fixed crib was delivered by luting the appliance with Glass ionomer cement on upper permanent first molars.

After 2 weeks, the parents reported that child had discontinued the habit. It was decided to continue the appliance for another 8 weeks so that there is no reversal of habit, to correct the tongue thrust habit which was associated and to allow the eruption of upper permanent lateral incisor. After 8 weeks the parents confirmed that there have been no sucking episodes, anterior open bite had got corrected, and the appliance was removed. (Figure 2, 3).



Fig 2 - Post operative with Fixed Crib appliance



Fig 3- Post operative, anterior open bite corrected

## Discussion

The primary objective of managing orthodontic problems in the mixed dentition stage is to intercept or correct malocclusions that would otherwise become progressively more complex in the permanent dentition or result in skeletal anomalies. Any procedure that eliminates or reduces the severity of malocclusion

in the developing dentition. (Popovich and Thompson 1979, Hiles 1985.) is termed as interceptive orthodontics

Treatment of thumb sucking can be broadly divided as

- (1) psychological approach
- (2) Reminder therapy
- (3) Mechano therapy.

### Psychological approach

Age-appropriate explanations to the child and positive reinforcement are necessary for the success of clinical management.<sup>8</sup> Explaining the effects of digit-sucking and the need for stopping is often all that is required to break the habit. The child is positively reinforced and rewarded for making the effort to discontinue the habit. "Contingency contract" is a contract made between the child and dentist or child and parent. The contract simply states that the child should not suck their thumb for specific period of time. The child should be rewarded if the requirement of the contract is met.

### Reminder Therapy

Painting that tastes bad on the thumbs can make sucking less satisfying. Physical barriers like band aids; gloves etc can also be used. Clinical experiences have revealed that a bitter solution usually has a limited effect.<sup>5</sup> Application of adhesive tape may cause sweating or infection and may also have the risk of reducing blood circulation.<sup>9</sup> Alteration of the child's pajamas to prevent the movement of hand to mouth usually increases the child's frustration and wakefulness.<sup>10, 11</sup>.

### Mechanotherapy

In children with deeply ingrained habits and when above interventions did not succeed, appliance therapy can be used. It includes the use of fixed or removable habit breakers designed to make the sucking habit difficult or unpleasant. The palatal crib acts as a physical deterrent to habit as well as a reminder. It is not meant as a punishment but to overcome the habit.

In the present case all the local measures have been tried by the parents themselves. The child wanted to get rid of the habit but was unable to do so. For an appliance therapy to work, the child should have understanding of the purpose of treatment and be motivated. Upper first permanent molars should be fully erupted or, less preferably, the upper second deciduous molars should not be mobile to allow retention of the orthodontic appliance.

Maxillary changes associated with a prolonged sucking habit are proclination of the maxillary incisors<sup>11</sup>, decreased palatal arch width, increased maxillary arch length, cephalometrically increased sella-nasion-point A angle, anterior placement of the maxillary apical base.<sup>12</sup> The response to the changes in the axial inclination of the incisors is anterior rotation of the occlusal plane. Underlying mechanisms of the malocclusion are direct pressure from the digit and reduced intraoral pressure produced by sucking<sup>13</sup>

Effects on the mandible include proclination of the mandibular incisors, decreased sella-nasion-point B angle and increased intermolar distance. Other dental alterations are increased overjet,<sup>11, 13</sup> decreased overbite,<sup>11</sup> posterior cross bite<sup>14, 15 16,17</sup>. There is positive correlation between the distal occlusion and cross bite due to thumb sucking habit.<sup>18,19</sup> When thumb sucking habit exceeded more than 18 months, there is significant occurrence of Class II division 1 of malocclusion, protrusion of upper anterior teeth, skeletal type of malocclusion and anterior open bite.<sup>20</sup> The tongue and lips are also affected by sucking. Lip incompetence and tongue thrust are usually associated with sucking habits. Electromyography studies indicate that circumoral muscles are especially active during digit sucking in addition to the cheek pressure in the canine region<sup>21</sup>.

In the present case there has been correction of thumb sucking, tongue thrusting habit, anterior open bite, spacing of upper anterior teeth which got self corrected with eruption of permanent laterals taking the advantage of growing phase of the child. Intervening harmful habit in a developing dentition promotes favorable developmental changes and removes or suppresses those that are unfavorable. Early interception can eliminate or reduce the severity of a developing malocclusion, the complexity of orthodontic treatment, overall treatment time and cost. It also improves self-esteem in the child and parent satisfaction.

## References

- 1) Graber TM. Thumb and finger sucking. *Am J Orthod* 1945;45:258.
- 2) Johnson ED, Larson BE. Thumb-sucking: Literature review. *ASDC J Dent Child* 1993;60:385-91.
- 3) Nanda RS, Khan I, Anand R. Effect of oral habits on the occlusion in preschool children. *ASDC J Dent Child* 1972;39:449-52
- 4) Infante PF. An epidemiologic study of finger habits in preschool children, as related to malocclusion, socioeconomic status, race, sex, and size of community. *ASDC J Dent Child* 1976;43:33-8
- 5) Alemran SE. A new method in reminder therapy technique for ceasing digit sucking habit in children. *J Clin Pediatr Dent* 2000;24:261-3.
- 6) Fukuta O, Braham RL, Yokoi K, Kurosu K. Damage to primary dentition resulting from thumb and finger sucking. *ASDC J Dent Child* 1997;63:403-7.
- 7) Sarkar S, Chowdhury K S, Mukherjee M M. Prevalence of thumb sucking in children of Calcutta. *J Indian Soc Pedod Prev Dent* 1996;14(1):33-6.
- 8) Van Norman R. Digit sucking: It's time for an attitude adjustment or a rationale for the early elimination of digit-sucking habits through positive behavior modification. *Int J Orofacial Myology* 1985;11:14-21.
- 9) Benjamin LS. The beginning of thumb sucking. *Child Dev* 1967;38:1065-78.
- 10) Morley M. Management of non-nutritive or digit sucking habits in children. A practical approach. *Pediatr Dent J* 1994;16:969-71.
- 11) Larsson E. Dummy and finger-sucking habits with special attention to their significance for facial growth and occlusion. Effect of facial growth and occlusion. *Sven Tandlak Tidskr* 1972;65:605-34.
- 12) Willmot DR. Thumb sucking habit and associated dental differences in one of monozygous twins. *Br J Orthod* 1984;11:195-9.
- 13) Larsson E, Ronnerman A. Clinical crown height in 9, 11 and 13-year old children with and without finger-sucking habit. *Br J Orthod* 1981;8:171-3.
- 14) Modeer T, Odenrick L, Linder A. Sucking habits and their relation to posterior cross-bite in 4-year-old children. *Scand J Dent Res* 1982;90:323-8.
- 15) Popovich F, Thompson GW. Thumb and finger sucking: Its relation to malocclusion. *Am J Orthod* 1973;63:148-55
- 16) Moss JP, Picton DC. The problems of dental development among the children on a Greek Island. *Dent Pract Dent Rec* 1968;18:442-8
- 17) Proffit WR, Field HW, Ackerman JL, Thomas. *Contemporary Orthodontics*. St Louis Toronto, Canada: The C.V. Mosby Co; 1986. Houston WJ. Mandibular growth rotations-their mechanisms and importance. *Eur J Orthod* 1988;10:369-73
- 18) Melson B, Stensgaard K, Pedersen J. Sucking habits and their influence on swallowing pattern and prevalence of malocclusion. *Eur J Orthod* 1979;1:271-80
- 19) Mylarniemi S. Oral and dental state in Helsinki Pre-school children III. Prevalence of dummy and finger sucking habit and V oral habits and occlusion. *Proc Finnish Dent Soc* 1973;69:47-51.
- 20) Singh SP, Utreja A, Chawla HS. Distribution of malocclusion types among thumb suckers seeking orthodontic treatment. *J Indian Soc Pedod Prev Dent* 2008;26(7):114-7.
- 21) Carvajal R, Miralles R, Cauvi D, Berger B, Carvajal A, Bull R. Superior orbicularis oris muscle activity in children with and without cleft lip and palate. *Cleft Palate Craniofac J* 1992;29:32-6.

# Case Report

## Stylalgia – Eagle’s Syndrome

Dr.R.Shyamala, Consultant E.N.T Surgeon, Chettinad Super Speciality Hospital (C.S.S.H), Kelambakkam, Tamil Nadu, India.



Dr.R.Shyamala belongs to 1982 M.B.B.S. batch from Thanjavur Medical College. She completed her post graduate diploma in E.N.T from Madras Medical College in 1996. She subsequently acquired surgical skills by serving in municipal hospitals in Mumbai for 7 years. She has also had a formal training for 2 years in endoscopic sinus surgeries under an eminent E.N.T surgeon in Chennai before joining Chettinad hospitals in December 2005. She has publications to her credit and has presented papers in south zone E.N.T conferences and local Chennai chapter many a times. Her areas of interest are endoscopic skullbase surgeries and endoscopic microlaryngeal surgeries.

Corresponding author - Dr. R. Shyamala ([shyamala\\_rajaraman@yahoo.co.in](mailto:shyamala_rajaraman@yahoo.co.in))

Chettinad Health City Medical Journal 2012; 1(2): 65 - 66

### Abstract

Eagle’s syndrome is not an uncommon condition, but less known to Physicians where an elongated styloid process or calcified stylohyoid ligament compresses the adjacent anatomical structures leading to orofacial pain. Pain often gets relieved by amputation of styloid process.

**Key Words:** Styloid process/ Stylohyoid ligament / Eagle’s syndrome / Stylalgia

### Introduction

Eagle’s syndrome was first described by an American Otorhino laryngologist Watt weems Eagle in 1937.<sup>4</sup> This syndrome should be considered as one of the important causes in the differential diagnosis of orofacial pain. Its symptoms are often confused with those attributed to a wide variety of oropharyngeal, maxillo-facial and neurological diseases. We present one such case in our hospital.

### Case History

A 52 yrs old teacher from Tripura, came to us with complaints of persisting nagging pain over the ( R ) side of the throat radiating to face and ipsilateral ear for the last 2 yrs and not relieved by any analgesics and antidepressants. He was examined by general surgeon, Oromaxillaryfacial surgeon and Neurologist elsewhere and found to be clinically normal. ENT examination here showed normal oropharynx on inspection. But a bony mass was felt on the ( R ) tonsillar fossa and was tender on palpation, which again confirmed the site of pain. The diagnosis was confirmed by X ray Skull base and C.T Scan (Fig 1,2). It showed elongated styloid process both sides, (R) > (L) side. By intraoral approach excision of styloid process (R) side was done. Initially tonsillectomy was done on the right side. The superior constrictor muscle was divided on the tonsillar bed. Styloid process identified and stripped of its periosteum upto its attachment to the base and excised (fig 3). Muscle sutured with vicryl. Post operatively the patient was relieved of pain.

### Discussion

Specific orofacial pain secondary to calcification of stylohyoid ligament or elongated styloid process has been known as Eagle’s syndrome. Eagle defined the normal length of styloid process as 2.5 to 3cm. Coorel et al (1979) defined the normal length as < 2.5cm. Lindemann considered normal as <3cm. On an average > 2.5 to 3cm is considered significant. 4% of the general population is affected by this and out of this only 4% are symptomatic.<sup>1,4</sup> Male : female ratio is 1:3. Bilateral is quite common, but symptoms are mostly unilateral. It manifests as dull aching persistent pharyngeal pain, radiating to the ipsilateral ear, or foreign body sensation in the throat, occasionally head ache and tinnitus aggravating on turning the head. Etiology is highly debatable. May be trauma or embryogenic origin<sup>2,6</sup> osseous metaplasia of Reichert’s cartilage residue from which styloid process develops. Clinical presentation may be of two types classic form and stylo carotid form<sup>4</sup>. In the stylo carotid form compression of external / internal carotid artery by deviated elongated styloid process produces tinnitus, headache and orofacial pain. The pain aggravates typically on rotation of the head. Imaging studies like OPG, CT Scan of Skull base with 3D reconstruction and neck help in confirming the diagnosis<sup>3</sup>. Relief by injection of Xylocaine over the tonsillar fossa is also a simple bedside diagnostic procedure. Medical treatment includes analgesics, anticonvulsants, antidepressants. Surgical excision can be done by intra oral or extra oral approaches<sup>5</sup>. The common complications are neck space infection and facial nerve involvement. Careful dissection and good antibiotic coverage pre and post operatively can avoid these complications. To conclude, in a non specific orofacial pain there should be a high index of suspicion of stylalgia – Eagle’s syndrome.

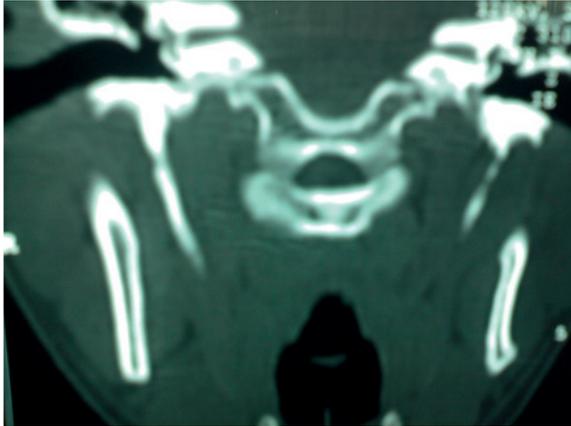


Fig 1. HRTCT skull base showing elongated styloid process

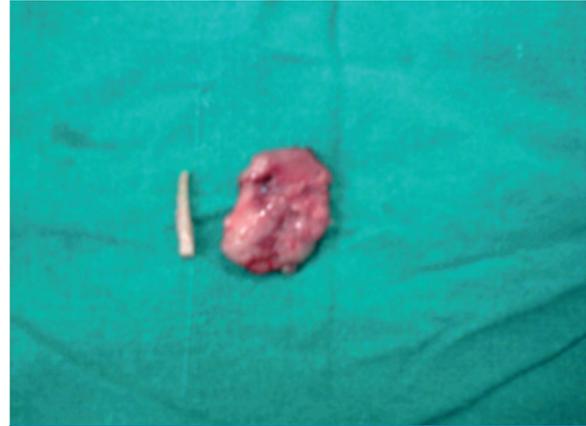


Fig 3. X – ray skull base showing styloid process elongation



Fig 2. X – ray skull base showing styloid process elongation

## References

- 1) Karam C, Koussa S. "Eagle syndrome: the role of CT scan with 3D reconstructions". J Neuroradiol. 2007; 34 (5): 344-5
- 2) Oluseisi AD. Traumatic Eagle’s syndrome. Int.J.Otorhinolaryngol.2006; 4:2
- 3) Ryan MD. CT findings associated with Eagle’s syndrome. – AJNR AMJ Neuroradiol 2001; 22:1401-2
- 4) Eagle WW, "Elongated styloid process." Archives of otolaryngology; 1937; 25: 584-587
- 5) Buono V, Magone GM, Michelotti A, Longo F and Calcifano L, Surgical approach to the stylohyoid process in Eagle’s Syndrome - Journal of Oral and Maxillofacial Surgery; 2005; 63(5): 714-716
- 6) Roca A , Armengot M, Gimenez G, Basterra J, "Surgical treatment of Eagle’s Syndrome by way of oropharynx, a case report. Acta Otorrinolaringologica Espanola; 1992; 43(3): 2010-12

## Emptying Slowly Into Thinness

Rate of gastric emptying determines the intensity of hunger and quantum/frequency of food intake. So, one of the possible mechanisms to regulate food intake is to control the rate of gastric emptying. In a new study carried out in animals, Xinfu Guan and team at Baylor College of Medicine in Houston discovered how the hormone Glucagon-like peptide 2 (GLP 2) slows the rate of gastric emptying. This hormone functions as a neurotransmitter acting through its receptors on a group of neurons called pro-opiomelanocortin (POMC) neurons located in hypothalamus. In the study, they found that mutant animals lacking GLP 2 receptor had accelerated gastric emptying and developed late onset obesity. Therefore, the researchers speculated that obese people may have something wrong with this receptor, which alters their gastric emptying rate. Many studies have shown that non-diabetic, obese humans have accelerated gastric emptying. The results were presented at The Endocrine Society's 94th Annual Meeting in Houston

[<http://www.medicalnewstoday.com/releases/247076.php>]

- Dr. K. Ramesh Rao

# Case Report

## The Role of Buccal Fat Pad in the Surgical Management of Oral Submucous Fibrosis

Dr. M. Alagappan\*, Dr. S. Vijay parthiban\*\*, Dr. R. Sathish Muthukumar\*\*\*

\*Associate Professor, \*\* Senior Lecturer, \*\*\*Professor, Dept. of Oral & Maxillofacial Pathology, Chettinad Dental College & Research Institute (CDCRI), Kelambakkam, Tamil Nadu, India.



Dr. M. Alagappan graduated from Ragas Dental College, Chennai. He did his Masters in Oral & Maxillofacial Surgery from Nair Hospital Dental College, Mumbai, one of the best dental schools in Asia, under the prestigious Mumbai University. He is a DNB in Oral & Maxillofacial Surgery. He is also a Member of Faculty of Dentistry of Royal College of Physicians & Surgeons of Glasgow (MFDSRCPS). He attended a clinical training in Orthognathic Surgery at Sunninghill hospital, Johannesburg, South Africa in 2008. His areas of interest include Maxillofacial Trauma, Orthognathic Surgeries and TMJ surgeries. He is currently working as Associate Professor in the Department of Oral & Maxillofacial Surgery, Chettinad Dental College & Research Institute.

Corresponding author - Dr. Alagappan (alagumds@gmail.com)

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### Abstract

The buccal fat pad is commonly used in oral surgical procedures as it can be harvested easily, is reliable and has minimal complication. The volume of buccal fat pad is important when used for grafting in oral submucous fibrosis to achieve adequate coverage of surgical defect. The fat pad undergoes atrophy as age advances and in severe cases of oral submucous fibrosis, and the availability of normal to good volume of buccal fat is rare in these group of patients. Adequate volume of buccal fat pad is necessary to cover the surgical defect in oral submucous fibrosis. In majority of patients the fat pad undergoes atrophy as the disease progresses. After grafting, the buccal fat is replaced by stratified squamous epithelium over a period of time. We present a peculiar case of oral submucous fibrosis treated surgically with buccal fat pad grafting with special emphasis on the volume of fat obtained.

**Key Words:** Buccal fat pad volume, submucous fibrosis, epithelialisation

### Introduction

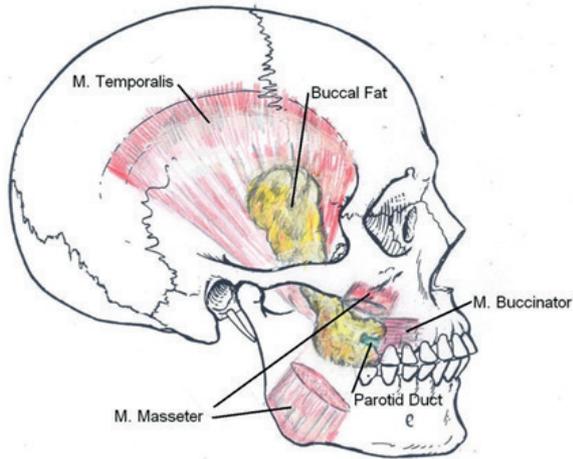
Different treatment modalities including medical, surgical or a combination of both have been tried by various workers in the treatment of submucous fibrosis with variable success rates with no universally accepted protocol mainly due to the fact that the disease is not fully understood and it is progressive in nature. The younger the age, the more rapid the progression of the disease, and more likely the recurrence of symptoms.<sup>1</sup>

The surgical procedure includes excision of fibrous bands with grafting of raw area with various graft materials like split skin graft,<sup>2</sup> palatal island flaps,<sup>3</sup> nasolabial flaps,<sup>4</sup> tongue flaps,<sup>5</sup> buccal pad of fat<sup>6</sup>, placental grafts,<sup>7</sup> and radial forearm free flaps.<sup>8</sup> The grafting procedure may be combined with bilateral temporalis myotomy and coronoidectomy with extraction of all wisdom teeth<sup>9</sup>.

### Case Report

A 45 year old female patient reported with the chief complaint of burning sensation and decrease in mouth opening for 3 years. The patient gave a history of pan and areca nut chewing habit for 7-8 years. Examination revealed palpable fibrotic bands in the buccal mucosa, rima oris and retromolar area bilaterally. Mucosal blanching was seen on the hard and soft palate with involvement of uvula and floor of mouth.

The mouth opening of the patient was 1.5 cm (fig.2). The patient was operated for the release of fibrotic bands under general anaesthesia. The incisions were made along the buccal mucosa at the level of the occlusal plane away from the orifice of parotid duct. They were carried posteriorly to the pterygomandibular raphe or anterior pillar of the fauces and anteriorly as far as the corner of the mouth, depending upon the location of the fibrotic bands which restricted the mouth opening. Bilateral coronoidectomy (fig.3) temporalis myotomy and extraction of all wisdom teeth was done. An acceptable mouth opening of 3.5 cm was achieved. Buccal fat pad was teased out by dissecting a tunnel along the ascending ramus of the mandible and from lateral surface of buccinator muscle by gentle dissection and lateral pressure on the cheeks. The buccal fat pad of volume about 15 ml and thickness of about 8 mm was obtained, which is a rare occurrence among female patients with severe oral submucous fibrosis. The fat was interposed in the raw area and was sutured to the mucosa using reabsorbable suture material. The same procedure was performed bilaterally (fig.4, 5). The patient was kept under antibiotic cover and nasogastric feed for 5 days. The mouth opening exercises were started from second postoperative day onwards. At the end of one year follow up the patient had a mouth opening of 3.2 cm and had good epithelialisation of buccal pad of fat grafted over the raw area (fig.6, 7).



**Fig 1:** Anatomy of Buccal fat pad



**Fig 5:** Buccal fat pad covering the raw area in the surgical site (left side)



**Fig 2:** Preoperative mouth opening (<2cm)



**Fig 6:** Postoperative mouth opening (1 year) measuring 3.2cm



**Fig 3:** OPG showing bilateral coronoidectomy



**Fig 4:** Buccal fat pad covering the raw area in the surgical site, bilaterally (Right side)



**Fig 7:** Epithelialisation of buccal fat pad at the surgical site bilaterally at the end of 1 year

## Discussion

The buccal fat pad is a biconvex disc of vascularized fat lying behind the zygomatic arch (fig1). The buccal fat pad can be divided into three lobes-anterior, intermediate, and posterior-according to the structure of the lobar envelopes, the formation of the ligaments, and the source of the nutritional vessels. The buccal, pterygoid, pterygopalatine, and temporal extensions (superficial and profound) are derived from the posterior lobe. The buccal fat pad is fixed by six ligaments to the maxilla, posterior zygoma, and inner and outer rim of the infraorbital fissure, temporalis tendon, or buccinator membrane. Several nutritional vessels exist in each lobe and in the subcapsular vascular plexus forms. The buccal fat pads function to fill the deep tissue spaces, to act as gliding pads when masticatory and mimetic muscles contract, and to cushion important structures from the extrusion of muscle contraction or outer force impulsion.<sup>10</sup> The buccal pad of fat is supplied by branches of the facial artery, the internal maxillary artery, and the superficial temporal artery.<sup>11,12,13</sup>

Histological examination of pedicled buccal fat pad graft in oral submucous fibrosis on weekly interval showed inflammatory cell infiltrate, blood vessel congestion, and fibrinous exudates covering the buccal fat pad which were obvious by 2nd week. At 3rd week, blood vessel congestion and fat cell number decreased markedly. Evidence of stratified squamous epithelium with parakeratosis was seen in the margin of the buccal fat pad graft. At 4 weeks, the number of fat cells decreased significantly and the original Buccal Fat Pad was almost completely replaced by granulation tissue. The original buccal fat pad was fully covered by stratified squamous epithelium by 5 weeks.<sup>14</sup>

The volume of the buccal fat pad may change throughout a person's life. The volume in adult ranges from 8.3-11.9 ml. The mean volume in males is 10.2ml and ranges between 7.8-11.2ml, while in females the mean volume is 8.9ml and ranges between 7.2-10.8ml.<sup>15</sup> Defects of size upto 12 cm<sup>2</sup> to 15 cm<sup>2</sup> can be closed using buccal fat pad alone without compromising the blood supply. In severe oral submucous fibrosis the buccal fat pad is atrophic and the anterior reach of fat is inadequate. Though in majority of patients with oral submucous fibrosis the buccal fat pad undergoes atrophy as the disease progresses, we obtained about 15ml of buccal fat pad with thickness of 8mm, which is a rare occurrence among the female population with severe oral submucous fibrosis. The pedicled buccal fat pad harvested was adequate enough to cover the entire surgical defect and was eventually replaced by stratified squamous epithelium.

## References

- 1) Lai DR, Chen HR, Lin LM, Haung YL, Tsai CC. Clinical evaluation of different treatment methods for oral submucous fibrosis – A 10 year experience with 150 cases. *J Oral Pathol Med.* 1995;24:433-439
- 2) Marawetz G, Katsikers N, Weinberg S. Oral submucous fibrosis. *J Oral Maxillofacial Surg.* 1987;16:609-614
- 3) Khanna JN, Andrade NN. Oral submucous fibrosis: a new concept in surgical management. *Int J Oral Maxillofac Surg.* 1995;24:433-439
- 4) Chambers RG, Jaques DA, Hoopes JE. Nasolabial flap in intraoral reconstruction. *The Am J Surg.* 1981;142:448-449
- 5) Golhar S, Manohar MN, Narkhede S. Tongue flap in oral submucous fibrosis. *Ind J Otolaryngol.* 1989;41:104-107
- 6) Yeh CY. Application of buccal fat pad to the surgical treatment of oral submucous fibrosis. *Int J Oral Maxillofac Surg.* 1996;25:130-133
- 7) Mohd. Akbar. Oral submucous fibrosis – a clinical study. *JIDA.* 1976;48:365-373
- 8) Wei FC, Chang YM, Kidal M, Tsang WS, Chen HC. Bilateral small radial forearm flaps for the reconstruction of buccal mucosa after surgical release of submucous fibrosis: a new reliable approach. *Plast Reconstr Surg.* 2001;107:1679-83
- 9) Caniff JP, Harvey W, Harris M. Oral submucous fibrosis – its pathogenesis and management. *Br Dent J.* 1986;160:429-433
- 10) Zhang HM, Yan YP, Qi KM, Wang JQ, Liu ZF. Anatomical structure of the buccal fat pad and its clinical adaptations. *Plast Reconstr Surg.* 2002; 109 (7): 2509 - 18
- 11) Tideman H, Bosanquet A, Scott J. Use of the buccal fat pad as pedicled graft. *J Oral Maxillofac Surg.* 1986;44:435-440
- 12) Dublin B, Jackson It, Halim A, Triplett Ww, Ferreira M. Anatomy of the buccal fat pad and its clinical significance. *Hast Reconstr Surg* 1989;83:257-262
- 13) StuzlnJm, Wagstrom L, Kawamotohk, Baker Ti, Wolfe Sa. The Anatomy and clinical applications of the buccal fat pad. *Plast Reconstr Surg.* 1990;85:29-37
- 14) Chao CK, Chang LC, Liu SY, Wang JJ. Histological examination of pedicled buccal fat pad in Oral submucous fibrosis. *J Oral Maxillofac Surg.* 2002;10:60:1131-1134

# Case Report

## Congenital Diaphragmatic Hernia (Bochdalek Hernia) in an Adult

Dr.R.Anantharamkrishnan\*, Dr.K.Senthil Kumar\*\*, Dr.R.Karunanithi\*\*\*

\*Associate Professor, \*\*Assistant Professor, \*\*\*Professor, Department of Surgery, Chettinad Hospital and Research Institute, Kelambakkam, Tamil Nadu, India.



Dr.R.Anantharamkrishnan M.S., Dip in Lap., FMAS, is Associate Professor in the Department of Surgery. He did his M.B.B.S in Madras Medical College(1991 batch)and postgraduation in Kilpauk Medical College (2002 batch). He has done fellowship in minimal access surgery. He joined Chettinad Hospital and Research Institute in 2005. He has attended many national conferences and presented interesting clinical cases and case studies in surgery.

Corresponding author - Dr. R.Anantharamkrishnan (rasm2003@gmail.com)

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### Abstract

Bochdalek hernia, a congenital posterolateral hernia of the diaphragm, usually manifests in the neonatal period and occasionally in childhood. Symptomatic Bochdalek hernia is uncommon in adults. Patients are usually investigated and treated for other diseases, therefore diagnosis is purely incidental. Here we report a patient who presented with features of chronic respiratory distress, who on investigation was found to have diaphragmatic hernia which was later operated.

**Key Words:** Congenital diaphragmatic hernia, Bochdalek hernia, plication of diaphragm, mesh reinforcement.

### Introduction

Lazarus Riverius first described congenital diaphragmatic hernia (CDH) in 1690, which was found incidentally in a 24 year old man at post-mortem<sup>1</sup>. CDH occurs 1 in 2000-3000 live births and accounts for 8% of all major congenital anomalies. CDH generally presents in the first few hours of life. Traumatic hernia can present in any age group. CDH presenting late in adolescence and adult life is a very rare entity. CDH are well recognized defects in the diaphragm through which herniation of abdominal contents occur, whereas eventration of diaphragm is abnormally elevated portion of diaphragm (one or both) from paralysis or atrophy of muscle fibres. The continuity of the fibres of diaphragm and attachments with costal margins are maintained in eventration.

### Case Report

A 25 year old male patient was admitted in the medicine ward with complaints of breathing difficulty on and off for the past one and half years. The patient was examined and investigated for cardiac and respiratory disease, and a diagnosis of eventration of diaphragm was made and was transferred to the surgery department. On receiving the patient his vitals were stable with a pulse rate of 84/min, blood pressure of 130/80 mmHg, no pallor, no cyanosis. His apex beat was slightly shifted towards midline. Air entry was good on both sides. His bowel sounds were heard even in the thoracic region in the region of left fifth space onwards.

Investigations showed a normal haemogram. Chest X-ray revealed an elevated left hemidiaphragm with mediastinal shift to the right side. Ultrasound abdomen was normal. His ejection fraction was 58% with trivial mitral regurgitation secondary to mitral valve prolapse on Echocardiogram. Barium enema (fig 2) showed a left hemidiaphragm elevation and the left part of the transverse colon appeared to ascend high up in the left hemithorax. CT scan of chest (fig 1) confirmed the upward displacement of bowel loops and the bowel loops were seen till the level of mid chest on the left side, with deviation of heart to right.

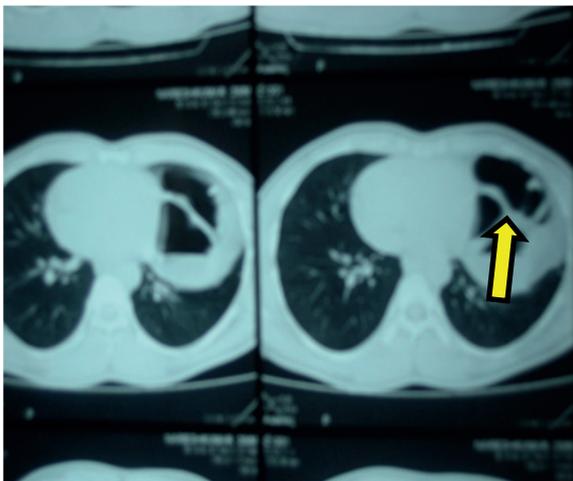
A diagnosis of left eventration of diaphragm was made. It was decided to plicate the diaphragm on the left side. The patient was taken up for surgery and the abdomen was opened by left subcostal incision. The diaphragm was highly placed and the left part of transverse colon was pulled up with the fundus of stomach and both appeared to be adherent to the diaphragm. Further dissection revealed a small defect of size 3 cms x 3 cms in the region of foramen of Bochdalek with a well formed sac with greater omentum as content herniating through the defect. Fundus of stomach and transverse colon were only adhered to the neck of the sac. The same were brought down. Omentum was reduced and the sac excised (fig 3). Intercostal drainage tube was introduced. The rent was closed with 1-0 prolene in two runs (fig 4). Postoperative period was uneventful and the patient slowly recovered from breathing difficulty and achieved complete relief of symptoms. The chest tube was removed when lung expansion was complete (fig 5).

**Discussion**

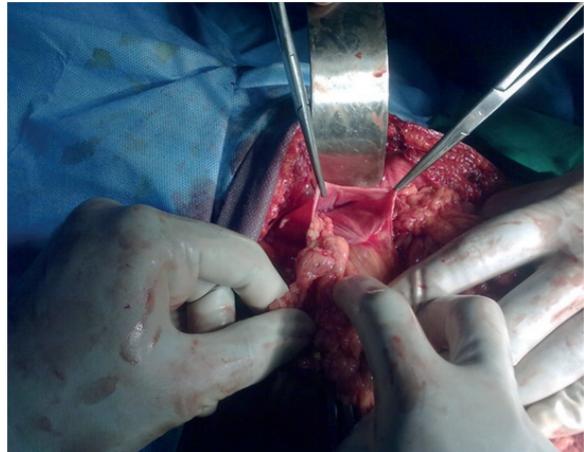
The Bochdalek hernia is the most common type of CDH, accounting for more than 95% of cases<sup>2</sup>.The majority cases(80-85%) occur in left side of diaphragm<sup>3,4</sup>. Other types include Morgagni’s hernia, eventration and central tendon defects.CDH has a mortality of 40-62%<sup>5</sup>, outcomes being more favourable in absence of other anomalies.

Bochdalek’s hernia most commonly manifests during first few weeks of life.Diagnosis beyond 8 weeks of life represent 5-25% of cases.<sup>6</sup> In adults most hernias are likely to be asymptomatic and thus finding is incidental The symptoms are typically vague and patients are evaluated for cardiac, respiratory or gastrointestinal diseases.<sup>3,6</sup>

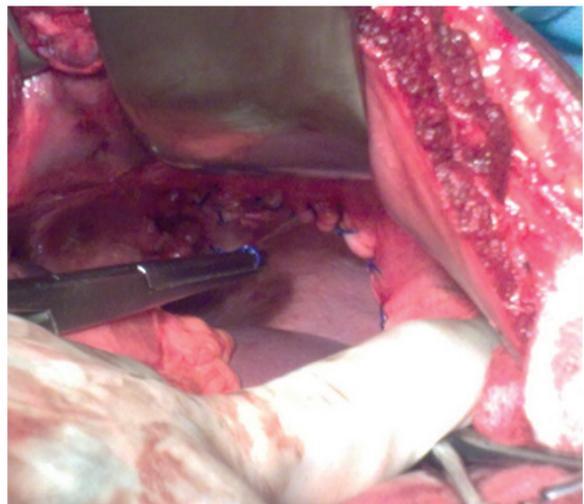
Treatment for eventration of diaphragm if symptomatic is surgical, just plication of the diaphragm without either incision of the membrane or excision of the pathologically altered segment. Patch reinforcement of a very thin membrane may be necessary.



**Fig 1.** CT image showing bowel loops in the region of mid chest level on the left side



**Fig 3.** Contents being reduced from the hernia sac



**Fig4.** Defect repaired using prolene sutures (non absorbable)



**Fig 2.** Barium enema showing transverse colon placed high in left hemithorax



**Fig 5.** Postoperative chest X-ray showing adequate lung expansion

Treatment for diaphragmatic hernia is essentially surgical - exploratory laparotomy, reducing contents after checking viability, closing the defect primarily with non-absorbable suture material<sup>10,11</sup>. A synthetic mesh or Teflon patch may be used to reinforce the repair<sup>8</sup>. Laparoscopic repair and thoracoscopic repair has also been described in the literature<sup>9</sup>. In cases presenting early in infancy, children have also been stabilized before surgery using high frequency oscillatory ventilation followed by definite surgical correction<sup>7</sup>. In our patient we did a primary closure of the defect. Patient follow up for 2 years showed no recurrence of symptoms nor the hernia.

The occurrence of CDH in adults is rare and misleading even to experienced clinicians, as patients present with symptoms mimicking other diseases. Hence high index of clinical suspicion is required for prompt diagnosis and treatment in order to avoid complications such as strangulation or bowel perforation.

## References:

- 1) Ravitch MM .Congenital diaphragmatic hernia .In: Nyhus.In.Hernia.London: Pitman medical Publishing,London;1962.p.527-545.
- 2) Salacin S,Alper B,Cekin N,Gulmen MK.Bochdalek hernia in adulthood:a review and autopsy case report.J Forensic science. 1994;39:1112-1116
- 3) Fine R,Borrero E,Stone A.Bochdalek hernia in adulthood. N Y State Med Journal .1987; 87:516-518
- 4) Nitecki S, Bar –Maor JA. Late presentation of Bochdalek haernia:our experience and review of literature. Isr J Med Sci .1992;28:711-714
- 5) <http://emedicine/medscape.com/article/978118-overview>.
- 6) Hines GL,Romero C.Congenital diaphragmatic hernia in adult.Int Surg .1983;68:349-351.
- 7) Migliazza L, Bellan C, Alberti D, Auriemma A, Burgio G, Locatelli G, Colombo A . "Retrospective study of 111 cases of congenital diaphragmatic hernia treated with early high-frequency oscillatory ventilation and presurgical stabilization". J Pediatr Surg.2007;42(9):1526-32.
- 8) Logan JW, Rice HE, Goldberg RN, Cotten CM . "Congenital diaphragmatic hernia: a systematic review and summary of best-evidence practice strategies". Journal of perinatology : official journal of the California Perinatal Association. 2007; 27 (9): 535-49
- 9) Becmeur F, Talon I, Schaarschmidt K, et al. "Thoracoscopic diaphragmatic eventration repair in children: about 10 cases". J. Pediatr. Surg.2005; 40 (11): 1712-5.
- 10) Torfs CP, Curry CJ, Bateson TF, Honoré LH . "A population-based study of congenital diaphragmatic hernia". Teratology.1992; 46 (6): 555-65.
- 11) Gaxiola A, Varon J, Valladolid G "Congenital diaphragmatic hernia: an overview of the etiology and current management". Acta Paediatrica .2009;98(4): 621-627.

## Success Is in Your Hormones

Every dieter knows that it is relatively easy to lose weight but to keep it that way is far more difficult. While some succeed, most don't. Is there some way to predict who will and who won't? Ana Crujeiras Martinez, an obesity researcher at the University Hospital of Santiago de Compostela, feels there is. She took a close look at the ratio of two hormones that tell the body about satiety and hunger: leptin and ghrelin. In the study, Martinez evaluated 88 overweight or obese men and women with an average age of 35. The leptin/ghrelin ratio was measured before the start of an eight week dietary regimen and the subjects were followed up for another six months to see who regained the weight. She found that those who regained the weight had leptin/ghrelin ratio that was two times higher than those who did not. She presented the findings on 24/06/12 at the Endocrine Society's annual meeting in Houston.

[<http://news.health.com/2012/06/26/hormone-ratio-may-show-which-dieters-will-keep-weight-off/#more-57154>]

- Dr. K. Ramesh Rao

# Case Report

## Hip Replacement in Neglected Acetabular Fractures

Dr.A.K.Venkatachalam, Associate Professor, Department of Orthopaedics, Chettinad Super Speciality Hospital, Kelambakkam, Tamil Nadu, India.



Dr.A.K.Venkatachalam graduated from Kilpauk Medical College, Tamil Nadu, India. He acquired Masters degree in Orthopaedics from Delhi University and Diplomate of National Board from the National Board of Examinations, India. He trained in Orthopaedics from one of Asia's busiest orthopaedic institutes, The Central Institute of Orthopaedics at Safdarjang Hospital, New Delhi. He gained extensive training in Joint replacement as a specialist registrar in Liverpool, Manchester, Glasgow and Cambridge, UK. He obtained his fellowship from the Royal College of Surgeons of Glasgow. He also obtained the prestigious Master's degree in orthopedic surgery from the University of Liverpool, UK. He has been working as a consultant in private hospitals in India and abroad for the last fifteen years. He has lectured at many national & international meetings. His current interests are joint replacements of hip, knee & shoulder. He is a proponent of less invasive & minimal invasive surgery. He also has a keen interest in arthroscopic surgery & autologous cartilage implantation.

Corresponding author - Dr.A.K.Venkatachalam (akvenkat15@hotmail.com, www.hipsurgery.in)

Chettinad Health City Medical Journal 2012; 1(2): 73 - 75

### Abstract

Acetabular fractures are often sustained in four wheeler accidents. Most patients are young. The ideal treatment is internal fixation in displaced fractures. In neglected fractures or following improper fixation, avascular necrosis and secondary osteoarthritis result<sup>1</sup>. In such cases total hip replacement is required. These case reports illustrate total and short stem hip replacement for neglected acetabular fracture.

### Case report

Case 1 - A 30 year old Nigerian male presented with a neglected acetabular fracture of two years duration.



Fig 1- Fracture of the posterior acetabular wall

The head of the femur is lying posteriorly on the ischium (Fig 1). It is a neglected posterior wall fracture with bone deficiency.

He was taken up for a one stage acetabular reconstruction and a total hip replacement.

### Technique

Acetabular reconstruction was achieved with a cortico-cancellous bone graft obtained from the resected femoral head. The posterior wall was recreated with bone graft fixed in place by a contoured reconstruction plate.

After achieving a contained acetabulum, it was prepared to receive an uncemented Pinnacle cup (Fig 2). This multi holed cup was fixed with four screws. A Corail uncemented stem was used on the femoral side. The bearings were Ceramic on ceramic (Fig 3). Ceramic on Ceramic hip replacements are a big boon to young patients suffering from hip arthritis.

### Case 2

A forty two year old male sustained a transverse fracture of the acetabulum in a four wheeler accident. A retained implant and heterotopic ossification is seen (Fig 4). This was treated by internal fixation one year ago. A recent X-ray showed malunion of the fracture with secondary osteoarthritis. He was treated by a short stem hip replacement with a 36 mm ceramic head (Fig 5).



Fig 2 - Uncemented total hip replacement



Fig 3 - Ceramic head



Fig 4 - Pre op x ray



Fig 5 - Short stem hip replacement with Proxima hip

## Discussion

Acetabular fractures are a leading cause of secondary osteoarthritis requiring total hip replacement. Usually these injuries occur in young people. Ideally, THR will be uncomplicated; however, associated problems may compromise the treatment and result<sup>2-4</sup>. Retained implants, bone defects, nonunion, innominate bone deformity, impaired musculature, heterotopic ossification, and infection are important to consider when planning reconstruction and hip replacement.

A posterior approach was chosen to perform the hip replacement in both cases.

Traditionally total hip replacement with an uncemented hip replacement has been successful. One of these two cases received a short stem hip replacement with the Proxima hip<sup>5</sup>. The Proxima hip has the advantages of preserving bone stock and permitting revision to a total hip replacement in future.

## Issues with neglected acetabular fractures

- 1) Retained metal work- It is wise to leave the metal work alone since chasing it would lead to

additional soft tissue dissection, resultant blood loss and infection.

- 2) Heterotopic ossification- This is classified by the Brooker classification. If bone is not interfering with dislocation of the head during exposure, then it can be left alone. The role of post op radiotherapy and Indomethacin is not firmly established.
- 3) Sciatic nerve injury- The leg should be flexed to 90 degrees during hip replacement to avoid stretching of the nerve and a secondary insult.
- 4) Bone deficiency – Obvious in the first case. Can be dealt with autologous or bank bone.

## References

- 1) Matta JM. Fractures of the acetabulum: Accuracy of reduction and clinical results in patients managed operatively within three weeks after injury. J Bone Joint Surg Am. 1996; 72:1632-1645.
- 2) Romness DW, Lewallen D. Total hip arthroplasty after fracture of the acetabulum. Long-term results. J Bone Joint Surg Br. 1990; 72:761-764.
- 3) Bellabarba C, Berger RA, Bentley CD, et al. Cementless acetabular reconstruction after acetabular fracture. J Bone Joint Surg Am. 2001; 83:868-876.
- 4) Weber M, Berry DJ, Harmsen WS. Total hip arthroplasty after operative treatment of an acetabular fracture. J Bone Joint Surg Am. 1998; 80:1295-1305.
- 5) A.K.Venkachalam.  
<http://www.orthopaedia.com/display/Cases/Short+Stem+Hip+Replacement+in+Protrusion+Acetabula>

### Wouldn't it Be Nice – Eating Cake and Losing Weight?

Every self-respecting nutritional expert is likely to tell you that eating high carbohydrate food is not the right thing to do if you are contemplating weight reduction. Will it be any different if you combine high carbohydrate dessert with high protein food for your breakfast? Apparently yes, if one is to accept the conclusions of a new study done in Tel Aviv University's Wolfson Medical Center in Israel comparing two diet regimens — one featuring a low-carbohydrate breakfast, the other a high-protein, high-carb breakfast. After four months, volunteers in both groups lost about 33 pounds each. Over the next four months, however, dieters eating low-carbohydrate breakfasts regained 22 pounds on average. But, those who'd had dessert with breakfast continued to lose weight, averaging another 15-pound weight loss. The researchers speculated that dieters who had sweets with breakfast had lower levels of ghrelin, the hunger hormone, so were less likely to crave the foods they'd eaten earlier in the day. The results are controversial and are disputed by established nutritionists. The findings were presented on 25/06/12 at the Endocrine Society's annual meeting in Houston.

[<http://news.health.com/2012/06/25/dessert-with-breakfast-boosts-weight-loss-study/#more-57146>]

- Dr. K. Ramesh Rao

# From the Pages of History

## Laugh your way to painlessness

Dr. Lailu Mathews\*, Dr. Thilaka Muthiah\*\*

\*Professor and Head of Dept. \*\*Assistant Professor, Dept. of Anaesthesiology, Chettinad Hospital and Research Institute, Kelambakkam, India.

Corresponding author - Dr. Lailu Mathews (lailu.mathews@gmail.com)

Chettinad Health City Medical Journal 2012; 1(2): 76 - 77

Nitrous oxide or laughing gas as we commonly know was discovered by Joseph Priestly. In the early part of eighteenth century, a lot of work went into the experiment of "airs" and "gases" in the belief that they could provide therapeutic effects. One night in 1772, when Priestly was experimenting with some of the gases he had already discovered, he mixed a few of them and discovered a new gas. He just couldn't stop laughing after inhaling this new gas, hence called it laughing gas.

Later, an influential American physician and US Senator Samuel Latham Mitchill (1764- 1831) gassed a few animals with nitrous oxide that killed the lot. He immediately proclaimed that the gas was not only poisonous but also contagious. It was only in 1800, thanks to a young scientist Humphry Davy, was this blame on nitrous oxide lifted. Davy, on inhaling nitrous oxide immediately realised that a bothersome erupting wisdom tooth felt just fine. Davy was working as a part time surgical assistant and came out with the idea that nitrous oxide can be used with advantage during surgical operations. However, not unexpectedly, his suggestions were overlooked by the surgeons and clinicians at that time. He resigned his position in 1801 and subsequently had a highly successful career that led him to the discovery of elements potassium, sodium, calcium to name a few. Regrettably, neither Davy nor any of his students continued studies on nitrous oxide. So, nitrous oxide had to wait another fateful forty years for it to be used as an anaesthetic.

Meanwhile, nitrous oxide continued to be used for recreational purposes and a medical student, Gardner Quincy Colton perfected the manufacture of nitrous oxide by heating ammonium nitrate. He went on to present scientific exhibitions, and on the night of December 10, 1844, there was one such exhibit at the Union Hall in Hartford, Connecticut. It was at the Colton exhibit that the dentist Horace Wells originated an idea that led to the demonstration of nitrous oxide as an anaesthetic. Wells noticed that a young man Sam Cooley, after taking in a lung full of nitrous oxide, tore about the room wildly without the slightest hint of having hurt his leg that was bleeding badly. When Wells enquired Cooley about his hurt leg, the latter was completely taken aback as he had no pain and had no clue as to how and when it happened. Here came the answer to painful tooth extractions! The following day Wells had his own tooth extracted and arranged for Colton to administer nitrous oxide. To Wells' relief, only a slight tinge of pain was felt and he proceeded to manufacture nitrous oxide as per Colton's instructions and used it for tooth extraction. Wells recognised the enormous potential of his discovery and arranged for a public demonstration at the Harvard Medical School in

January 1845. Wells' original plan was to administer the gas for a leg amputation. The patient scheduled for the surgery refused to accept the procedure with anaesthesia and a young male student agreed to undergo the extraction of his wisdom tooth with nitrous oxide inhalation. During the procedure, the subject moved and groaned. However, he later proclaimed that little pain was actually felt and he screamed due to fear. Nevertheless Wells' demonstration was called a "humbug", destroying the good doctor's reputation (Fig.2).



Fig 1: Horace Wells

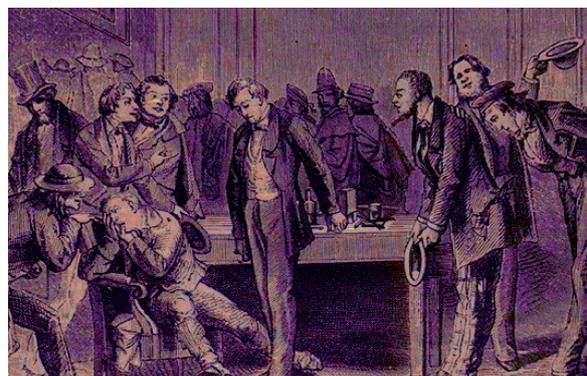


Fig 2: Unsuccessful demonstration of nitrous oxide in 1845.

Wells became dejected and later on, in 1848 died an infamous death, unaware of the fact that the French Academy of Sciences had just named him as the true discoverer of anaesthesia. Again nitrous oxide had to wait before it could be used as an anaesthetic. Meanwhile the historical successful demonstration of ether was made in 1846 by William Morton, a student and colleague of Wells.

Reintroduction of nitrous oxide as an anaesthetic in early 1860s was by the same man who first perfected its manufacture and whose lecture and demonstration Wells had attended in 1844- Gardner Colton. He joined with a dentist, Joseph Smith for the "painless extraction of tooth". The Colton Dental Association had treated nearly 200,000 patients between 1864 and 1897 without fatality. Until 1870, nitrous oxide was administered with air, and patients used to have a livid appearance.

Edmund Andrews suggested the use of nitrous oxide with oxygen, thereby providing analgesia without cyanosis. The anaesthetic in combination with oxygen was used in as early as 1880s to provide pain relief for labour. Later, the first anaesthesia machine was devised that could deliver variable portions of nitrous oxide and oxygen. These developments led to the reintroduction of nitrous oxide into the operating room, which was the prediction of Wells.

Though in the earlier years of discovery, nitrous oxide was less famous than its counterparts ether and chloroform, it is the only agent that has stood the test of time and is still being used in modern anaesthetic practice.

### Coffee in Moderation Is a Friend of Heart, Not a Foe

Conventional wisdom and American Heart Failure Guidelines clearly suggest that coffee drinking increases the heart failure risk. Conclusions of a new study fly in the face of this. Murray Mittleman (Beth Israel Deaconess Medical Center, Boston, Massachusetts, USA) and his team carried out a meta-analysis on five prospective studies of coffee consumption and heart failure risk published between 2001 and 2011. The studies included 6522 HF events among 140,220 men and women in Sweden and Finland. The researchers found that drinking two cups of coffee a day may significantly reduce risk for heart failure (HF); however, drinking any more than that could significantly increase the risk. The mechanism underlying the association between coffee consumption and HF risk is unclear, but previous evidence suggests frequent coffee drinkers develop a tolerance to caffeine, which may put them at a reduced risk for developing hypertension. Habitual coffee consumption has also been linked to a lower risk for developing Type 2 diabetes. The results are reported in *Circulation: Heart Failure*

[<http://www.news-medical.net/news/20120627/Two-coffees-a-day-keep-heart-failure-risk-at-bay.aspx>]

- Dr. K. Ramesh Rao

# Dialogue with the Stalwart

## Interview with Prof.C.K.Dhanashekar

Interviewed by Dr.Anitha, Associate Professor, Chettinad Dental College & Research Institute, Kelambakkam, Tamilnadu, India.

Chettinad Health City Medical Journal 2012; 1(2): 78 - 78



Students know him as a flawless and dedicated teacher, colleagues know him as a perfectionist, patients know him as the most trustworthy maxillofacial surgeon, people who have worked under him know him as an able administrator; when we went to meet this interesting person, we saw a carefree, totally unassuming gentleman, completely immersed in his textbooks and study materials. Yes! We are talking about one of the persons who laid the strong foundation for the ever-developing field of oral and maxillofacial surgery in Chennai- Prof. C.K. Dhanashekar. He graduated in dentistry in 1957 and started his teaching career the same year. A two year posting at the Stanley Medical College gave him a wider exposure and contact with the medical profession. Between 1960 and 1962, he completed his post-graduation from the Nair Hospital and Dental College Bombay, that included a short term training at the Tata Memorial cancer hospital, which gave him a broader experience in the field of maxillofacial surgery. He continued his teaching career on his return to Chennai in 1962, and pursued it uninterrupted till 1979. For the next two years, he went on to work in Benghazi, Libya, where he got the opportunity to see a different student as well as patient population. It was during this period that he also was a consultant to the famous Libyan leader Muammar Gaddafi. On persistent invitation, he took over the responsibility of developing a new dental college, which now has its students scattered all over the globe.

**CHC MJ** Why did you choose dentistry as a profession and Oral and Maxillofacial surgery as a specialty?

**Prof. CKD** The BDS course was first introduced in 1953, and it was an opportunity for me to enter the prestigious Madras Medical College. Having gone in to dentistry the pep talk of the professor of general surgery Dr.A.Venugopal, about Canadian dentistry greatly influenced me. When people in Canada can do it, people in India can do it better.

**CHC MJ** What difficulties did you encounter in developing the new specialty of oral and maxillofacial surgery?

**Prof. CKD** As the specialty was new, it required considerable effort to convince medical colleagues to come out of the old mould of dentists being "tooth pullers".

**CHC MJ** What is your opinion about the current state of oral and maxillofacial surgery?

**Prof. CKD** In more than half a century the specialty has come a long way. The scope of Oral and Maxillofacial surgery is steadily increasing and the boundaries are considerably widening.

**CHC MJ** What is your idea about the present day reforms in curriculum in dentistry (need of the hour)?

**Prof. CKD** It requires a forward thinking to alter the curriculum. The curriculum as it stands today is based on old concepts. More stress will have to be placed on health care problems. In some areas there is a repetition which can be avoided. The curriculum should be modified to accommodate more of medical subjects.

**CHC MJ** What is your idea about the present day examination evaluation patterns for UG and PG?

**Prof. CKD** The present day examination is limited to the extent of retrieving knowledge in a short span of time, more importance must be given in problem solving and planning by the student.

**CHC MJ** What do you think about the current state of medical and dental education in India?

**Prof. CKD** Since we have followed the British system it has stood the test of time. A small dose of steps to improve the original thinking of the student will go a long way.

**CHC MJ** Where do you see healthcare in India?

**Prof. CKD** Considering the population and economic status, health care will have to be borne by the state. It may take long time for health insurance to reach all the population.

**CHC MJ** What is your advice to the general public about Oral and Maxillofacial Surgery?

**Prof. CKD** The specialty of Oral and Maxillofacial Surgery is a bridge from general dentistry to general surgery. The maxillofacial surgeon should be aware and be competent to assume the role of bridge.

**CHC MJ** What is your advice to the youth of India?

**Prof. CKD** Irrespective of the field you choose, your aim should be to achieve the best. If it takes all your energy and effort to do it- do it.

# Letters to the Editor

## Normal and Abnormal Oocytes Observed During Assisted Reproductive Technique (ART) Procedures

Chettinad Health City Medical Journal 2012; 1(2): 79 - 81

### To the editor

Congratulations on the launch of a very interesting journal. I am sure under your leadership this peer reviewed journal would be well received and lot of informative articles will be submitted. There was a need for such a journal and I feel that this is the right step to share the knowledge.

I read the article on the quality of abnormal oocytes with interest and could not resist making the following comments:

a. Since most of the photomicrographs are of denuded oocytes, did the authors consider the time the oocytes were exposed to hyaluronidase enzyme and time taken to denude the oocytes? It is well documented that longer exposure time in the enzyme would lead to shrinkage of cytoplasm and expansion of PV space.

b. Empty Zona or cracked zona again are normally associated with poor denuding techniques.

c. Endoplasmic reticulum requires higher magnification than normally available through an inverted microscope. Did the authors confirm this observation at EM or through staining of the oocytes.

d. What would be important is to correlate the fragmented polar body with the results of PGS of polar body as a direct correlation has been reported.

Well done and once again congratulations.

#### Dr. Jayant G Mehta

Sub-Fertility Laboratory Director and Quality Control Manager, Sub-Fertility Unit, Barking, Havering and Redbridge University Hospitals NHS Trust  
Queen's Hospital.

[jayantgmehta@gmail.com](mailto:jayantgmehta@gmail.com)

### Author's reply

We thank Dr. Jayanth Mehta for his comments.

All the oocytes after pick up were washed and incubated for minimum of 1 hour before denudation. For denudation the oocytes were exposed to hyaluronidase for a maximum of 45 seconds. The time taken for denudation was a maximum of 1 minute which was done under IVF chamber which has CO<sub>2</sub> supply and warm stage. If the oocyte corona cells could not be denuded within 1 min, they were kept for incubation and were denuded later with a stripper.

Regarding the question on empty or cracked zona associated with poor denuding techniques, we feel that damage to oocyte zona can be due to the sharpness of the prepared glass pipette during denudation. Here we

use readymade flexipets of size 135 & 140 which is non embryo toxic and will cause less damage to the oocyte. However we feel trying with the bigger size of 170 size stripper followed by 135 size may reduce the incidence of broken zona.

On your question on endoplasmic reticulum, the endoplasmic reticulum observations were made out with the inverted microscope under 40 x magnification. sERCs can be clearly distinguished morphologically from fluid filled vacuoles under the inverted microscope. Cytoplasmic vacuolation is considered as cellular degeneration (Zamboni et al., 1972) and oocyte atresia (Nayudu et al., 1989). For some oocytes it was difficult to differentiate and since we don't have electron microscope or stains we consider those oocytes as vacuolated.

As we are not doing PGS (Pre-implantation Genetic Screening) we are not able to comment on your final question.

### References:

Zamboni L, Thompson RS and Smith DM (1972) Fine morphology of human oocyte maturation in vitro. *BiolReprod* 7,425- 457.

Nayudu PL, Lopata A, Jones GM, Gook DA, Bourne HM, Sheather SJ, Brown TC and Johnston WI (1989) An analysis of human oocytes and follicles from stimulated cycles: oocyte morphology and associated follicular fluid characteristics. *Hum Reprod* 4,558- 567.

Dr.Savitha ([savibds@yahoo.co.in](mailto:savibds@yahoo.co.in))

## Correspondence

### To the Editor

Congratulations on bringing out the first issue. Very interesting and appropriate articles. I especially enjoyed the one on Medical emblems. If I may, a couple of comments. Would it be possible to have the issue in a PDF format? It would be easier to load pages and read. Also, on the Editorial page, you are listed as the Chief Editor and on the contact page as the Editor.

**Dr.Sunder Mudaliar (mudaliar@ucsd.edu).**

Associate Clinical Professor of Medicine  
University of California, San Diego.

### To the Editor

The get up, format and contents are good. As you go along you could add career vacancies, information about training in hospitals in India and abroad, a quiz programme for staff and students, articles on medical insurance in various countries, information about consumers rights, information on latest technologies like laser, laparoscopy, bed side procedures and interventions. You could also include pathological conferences ets. clippings from reputed journals, caption like do you know etc. A good beginning has no doubt been made.

**Dr. M. S. Ramachandran (drmsra@gmail.com)**

Retd. Director, Institute of Medicine,  
Madras Medical College.

### To the Editor

Congratulations on spearheading this very commendable effort!. I am sure it will be a "must - read" publication for students , young doctors and senior practitioners alike.

In a day and age when some doctors do a cut and paste job with papers I am glad the thrust is on original and peer reviewed work.

I read your article on Semen Analysis with interest and loved your sentence about the seminal volume of the same man over a period of time being likened to the stock market fluctuations.

The piece on Oocytes by Embryologist Dr.Savitha , Dr Radha Pandiyan and Dr Ramesh Raja was educative while the piece on the Medical Emblem by Dr Ramesh Rao was thought provoking..

The layout is neat and easy on the eye.

All the very best in this very creative assignment and may you have hundreds of hits in the months and days ahead!

**Dr.SudhaUmashanker (sudha.ganesha@gmail.com)**

Senior Journalist.  
Chennai.

### To the Editor

Good work. Enjoyed reading the articles.

Would appreciate having a section on updates which are essential to know eg. interaction of Omeprazole and Clopidogrel.

Mangement of male infertility you started with sperm analysis - please tell what you would do if pus cells are present in the semen specimen etc.

**Dr. Nanda Kumar (nkshyla@gmail.com)**

Director, Gudalur Adivasi Hospital.



Bragatheeswarar Temple, Tanjore, India

## To the Editor

Congratulations on setting up a new Journal. Is it indexed by Index Medicus and the Science Citation Index? It would be a good idea to be so.

The first edition looks very good.

Would you like me to be an international editor. As such, I would be able to help by inviting contributions from authors based in different countries. I would be able to straddle neuroscience, developmental biology, fertility and regenerative medicine.

Late Dr. Sammy Lee.

Sammy Lee, Visiting Professor in Cell and Developmental Biology, University College London, passed away suddenly on 21 July 2012. Sammy was a great friend to many in the community and he will be remembered not only for his research, but also for being a skilled, patient and kind teacher. He will be greatly missed by his family and colleagues. In accordance with Sammy's wishes, a fund to support CDB students has been set up and can be accessed via <http://www.justgiving.com/Sammy-Lee-2012> or cheques can be sent to the Alumni Office.

## To the Editor

Congratulations to your team for this endeavour! It is amazing for the University to have a Journal of its own. I think this is the first of its kind in the private universities in India. Congratulations to Dr. Savitha for the nice article!

**Dr. Priya Kannan MBBS., M.Med., MCE**

Lecturer, Medical Genetics, The Tamil Nadu Dr. MGR Medical University, Chennai. Embryologist, Garbba Rakshambigai Fertility Centre, Chennai.

## To the Editor

Your journal is looking great. I will be happy to help.

**Prof. Arunasalam Dharmarajan,**

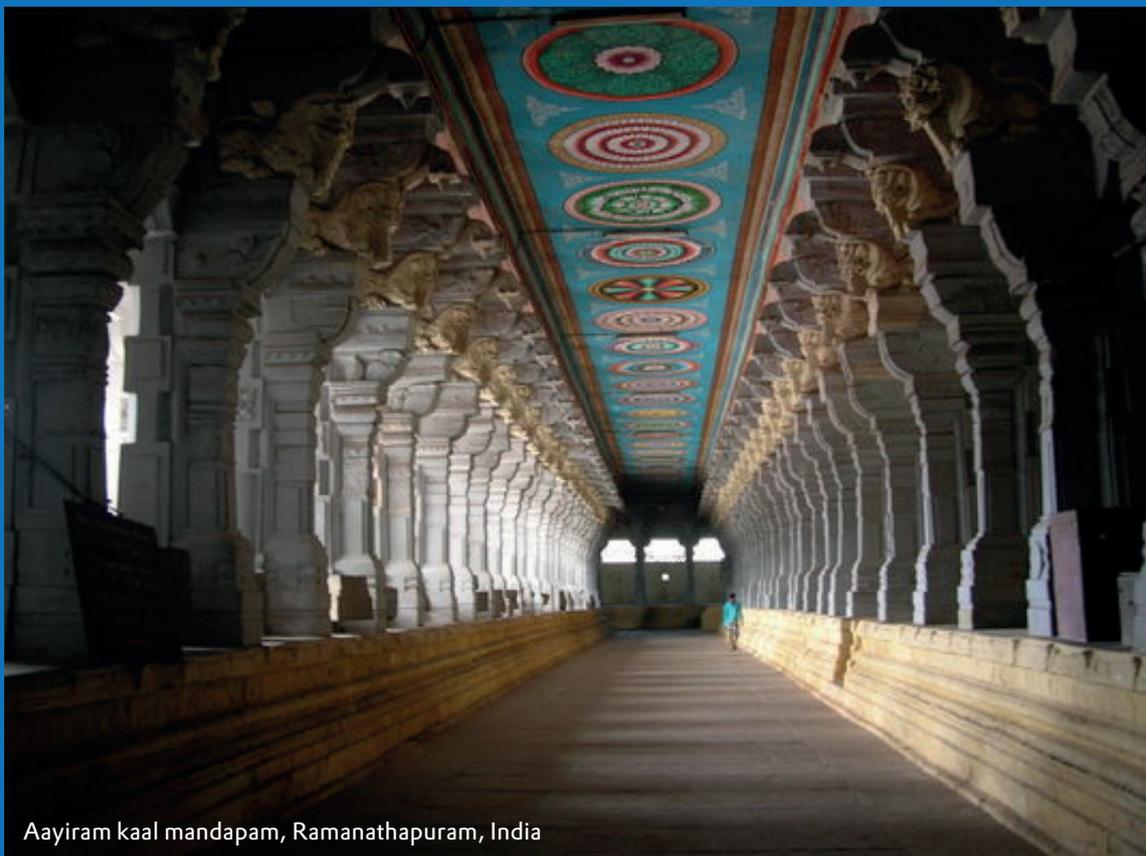
Professor | Faculty of Health Sciences, Co-ordinator South Asia Research Initiatives | School of Biomedical Sciences, Curtin Health Innovation Research Institute (CHIRI), Perth, Western Australia  
[arunasalam.dharmarajan@uwa.edu.au](mailto:arunasalam.dharmarajan@uwa.edu.au)

## To the Editor

I was very impressed by your new Medical Journal, thank you for giving me a copy.

**Dr. Richard J. Paulson, MD**

Professor and Vice-Chair,  
Department of Obstetrics and Gynecology  
Chief, Division of Reproductive Endocrinology and Infertility, Keck School of Medicine, University of Southern California



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**Dr. RUKKAYAL FATHIMA P**

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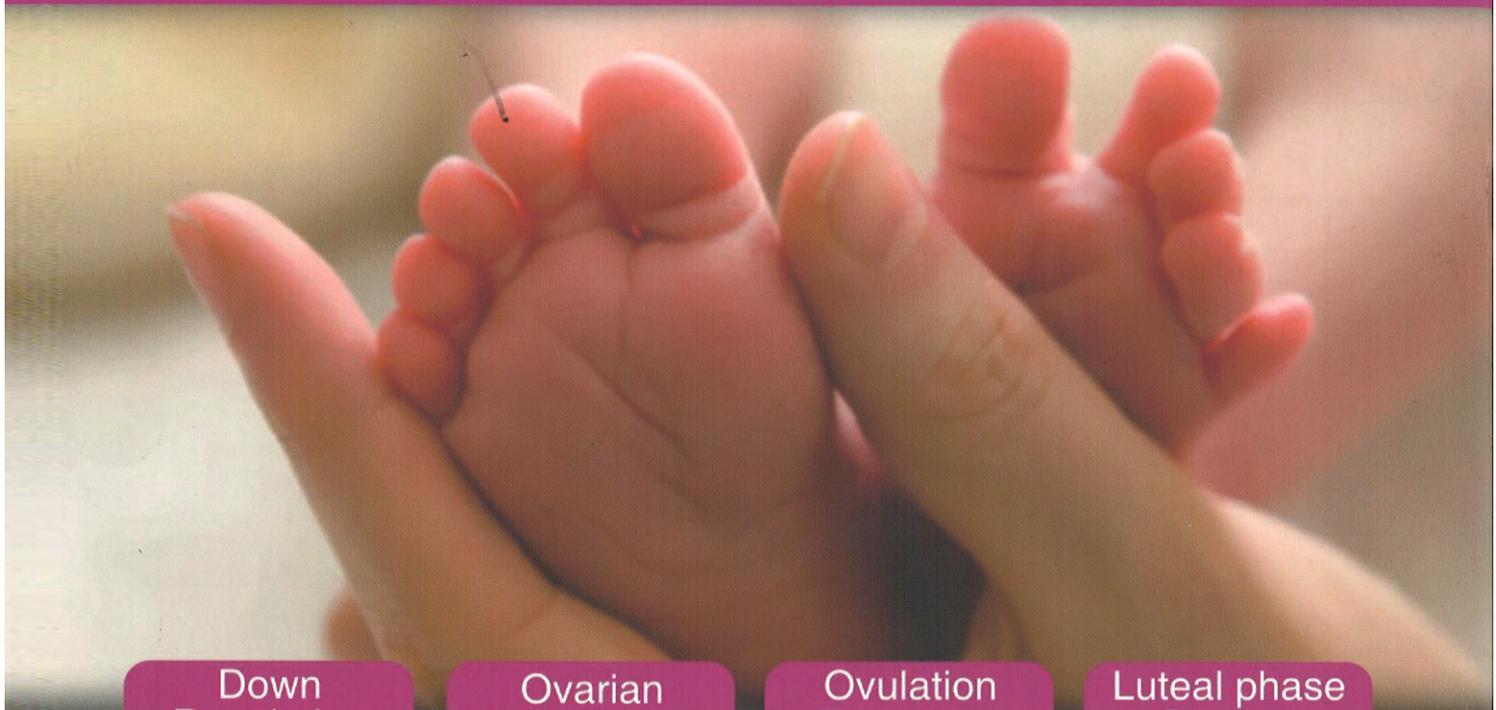
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