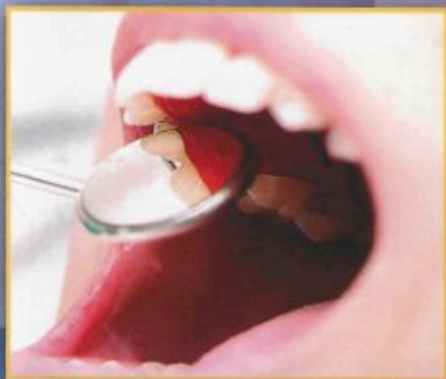


# INDIAN DENTAL ASSOCIATION



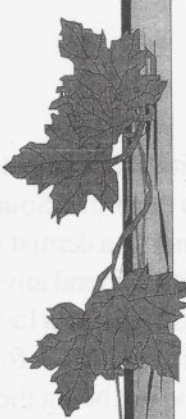
Meghalaya Branch



1st Meghalaya State  
Dental Conference Cum Scientific Session  
17th Aug. 2010

*Committed to Dental Excellence*

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**Hector Marwein I.A.S.,  
Principal Secretary to Governor**



Phone : (0364) 2223001/2223487

Fax : (0364) 2223338

**GOVERNOR'S SECRETARIAT**

Raj Bhavan

Shillong - 793 001

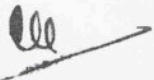


July 12, 2010

*Message*

*His Excellency, Shri Ranjit S. Mooshahary, Governor of Meghalaya is happy to learn that the Indian Dental Association Meghalaya Branch, Shillong is organizing the first Meghalaya IDA Conference and a souvenir is being brought out to mark the occasion.*

*His Excellency, the Governor conveys his best wishes for the success of the conference and hopes that the deliberations in the conference will throw new light on the latest scientific knowledge and practices in the field of Dentistry.*

  
(Hector Marwein)

**Mr. R. Lyngdoh**

**Deputy Chief Minister**

I/c Health & Family Welfare, Labour,  
Parliamentary Affairs, Home (Passport) &  
Administrative Reforms



Ph. No. : 2224568(O)

2640 (O)

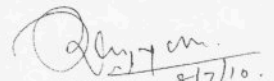
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*Message*

*I am glad to know that the India Dental Association Meghalaya Branch will be having a 1st IDA Conference and the Souvenir to commemorate the occasion will be released on that day.*

*On such important occasion, I send my best wishes for the success of the conference and that it will help the doctors and the paramedics in their service to the people of this region.*

  
8/7/10.  
(R. Lyngdoh)



**D.P. Wahlang, IAS**

Commissioner & Secretary  
Govt. of Meghalaya

## Message

*Shillong : dated 9<sup>th</sup> August, 2010*

*I am happy to note that the Indian Dental Association, Meghalaya branch is organizing the 1<sup>st</sup> Dental Conference and Scientific Session on the 17<sup>th</sup> of August, 2010 in Shillong.*

*We are all aware of the noble objective of the Indian Dental Association towards promoting the cause of dental excellence.*

*Dental care is perhaps one of the most challenging aspects of health care and I am sure that by arranging the Conference the latest issues pertaining to the subject would be discussed and deliberated which would end in a meaningful contribution to the citizens in the State.*

*I express my best wishes and blessings for the 1<sup>st</sup> Dental Conference and Scientific session in Shillong.*

*Sri. D.P. Wahlang IAS*

*Commissioner and Secretary to the government of Meghalaya*

*Dept. of health and Family Welfare*

*Meghalaya, Shillong.*



Dr. A.S. Kynjing  
Director of Health Services (M.I)  
Meghalaya ; Shillong  
Tel : 0364-2228493

## Message

*I am indeed very much delighted to share in the celebration of this Conference organized by the Indian Dental Association, Meghalaya Branch.*

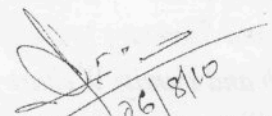
*Dental Service is know to be one of the noble profession to serve the sick and the suffering irrespective of the caste, creed, race and religion etc.*

*I only one to put in the mind of each and every one who are in this noble prefessionto work and serve to the best of your ability in your professional services.*

*I am happy to be a part of this programme which will mark the start of the First Dental Conference in our state, which will be a platform where all dental professionals of our state can get together to learn and interact with each other thereby upgrading their knowledge and skills exchanging information of the latest developments in their line of work. This should further help our society at large whereby the Dental professional can create awareness about the prevention and not only treatment of dental problems.*

*I wish this Conference cum Scientific Session a grand Success.*

*Thank you all*

  
(Dr. A.S. Kynjing)

**GOVERNMENT OF MEGHALAYA  
OFFICE OF THE JT. DIRECTOR OF HEALTH SERVICES (S.S)  
CIVIL HOSPITAL SHILLONG**

*Message*

*I am indeed happy to know that Meghalaya Branch of Indian Dental Association is organizing the First Dental Conference cum Scientific Session on 17<sup>th</sup> August 2010. Oral and Dental Health are very important for a healthy life specially for the children. I hope the Conference will give a clear signal to the people about preventive aspect of dental problems and also early detection and remedial measures that are to be taken. It is seen that 90% of the Dental and Oral diseases are preventable with proper hygiene and nutrition.*

*I wish the Conference a great success.*

  
Jt. Director of Health Services (SS)  
Civil Hospital, Shillong



## MEGHALAYA MEDICAL SERVICES ASSOCIATION

NO.MMSA/Genl./2008/84

Dated : 30<sup>th</sup> July 2010.

### Message

*The Meghalaya Medical Services Association (MMSA) is glad to know that the India Dental Association, Meghalaya Branch is organizing its 1<sup>st</sup> Dental Conference cum Scientific Session on 17<sup>th</sup> August 2010 and a souvenir is being brought out to commemorate the occasion.*

*"Committed to Dental Excellence" the motto of the Association and the theme of the conference is apt and we hope that the outcome will bring about further improvements in the delivery of Oral Health Care Services to the people of Meghalaya.*

*On this special occasion, we, on behalf of the MMSA wish the members of the India Dental Association all success in their future endeavours.*

*Thanking you,*

*Yours faithfully,*

(Dr. R. Nongbet)  
President, MMSA.

(Dr. A. Warr)  
General Secretary, MMSA.



*Message from our President  
IDA, Meghalaya Branch*

*Colleagues & Friends,*

*It has been four years since a group of dentists under the initiative of Col. Dr. Darekar formed the Indian Dental Association Meghalaya Branch. Dr. Darekar went on transfer not long after that and we continue with our activities and programmes. I am therefore particularly happy that we are having our first Dental Conference cum Scientific Session this year.*

*We have been able to organise a number of CDE & CDH program, hold National and CE meeting in our very own hometown Shillong. I give credit to each and everyone of you, who participated, especially the first Executive body, who really worked hard to make it a success. These program gives each one of us a chance to widen our horison scientifically as well as serving our society at large.*

*I sincerely call each and everyone of us to come together to make this conference a success and to continue to make this organization a strong and effective one.*

*With these words I wish the conference a grand success and my we continue with out motto "Committed to Dental Excellence".*



## **From the Editor's Desk .....!!!**

*December 19<sup>th</sup> 2009 an Annual General Meeting cum Election at Polo Towers, Shillong saw new office bearers for IDA Meghalaya branch. My last post as treasurer was no doubt interesting but three years of rolling in money that did not belong to you and keeping tap of finance could become monotonous, so I gladly handed over charge to my successor Dr. L. Lyngdoh, now the new treasurer of our branch.*

*The New Year dawned with new Executive Members and I, the new editor of IDA, Meghalaya branch.*

*Three years have passed since the birth of our branch I can still recall the day that 30 of us had gathered together under the able guidance of Dr. Darekar, to formally form the IDA, Meghalaya chapter. Young as we were, we had dreams, we had aspiration and we had a determined mind. Our main objectives are -*

- 1. Regular Continuing Dental Education*
- 2. Holding Camps and various programmes for the benefit of children and public at large.*
- 3. Hosting seminars and conferences*

*We have tried to reach out to the public, particularly the children through various awareness programmes and Dental check ups camps.*

*We have also tried to up grade ourselves through CDE programmes, where eminent speakers from all over the country have been kind enough to come all the way to our city and give us talks.*

*April 2008 also saw our branch playing host to the Central Council Meet where we had a chance to interact with doctors from all over the country. It was an overwhelming success.*

*But there is one important aspect I would like to mention here. With the experience*

of a past treasurer, I would like to say, it is indeed very difficult to run an organisation on such low funds. It is rightly said, money rules the show and today I would specifically like to take this chance to thank all our members who has contributed so generously, without a second thought to make the CC Meet a grand success.

As I conclude my editorial note, it is always seen that a souvenir is the last thing that we would pick up for a casual read. Therefore I have tried to make this edition more reader friendly. I hope you find the academic section informative enough to put it in practice and the other sections interesting and fun enough for you to want to keep reading.

An editor's job is usually a team work. Therefore, I would like to sincerely thank my team and also all the Committee Members for supporting me in this endeavour. It would be incomplete on my part to conclude this message without acknowledging some of my friends who have been with me. Therefore I am grateful to my HOD Dr. S. Synkon for allowing me to leave the department whenever I needed to. I am also grateful to my other colleagues of Civil Hospital Shillong for helping me out with my cases while I had to attend to the Souvenir. I would also like to thank all my friends who have contributed their articles here. Last but not the least my sincere thank goes to Mrs. Ibaphira Skhemlon and Mr. Alfonzo Kharkongor of SMS Hi-Tech Impression for being so patient with me as I sat with them doing the layout for the Souvenir.

*This being my first editorial job, may all my shortcomings be forgiven.*

*Long live IDA Meghalaya Branch*

*Khublei Shibun*

For any suggestion or contribution of articles, jokes, experiences, I am reachable at [nituppu@yahoo.com](mailto:nituppu@yahoo.com)

Website : [www.nituscorner.blogspot.com](http://www.nituscorner.blogspot.com)

## Members of the Executive Committee

*'Committed to Dental Excellence'*

|                        |                           |
|------------------------|---------------------------|
| President              | Dr. Freddy P. Nongkynrih  |
| Honorary Secretary     | Dr. Kyrpang Passah        |
| Central Council Member | Dr. Mrinal Bhowmik        |
| Vice President - I     | Dr. Raplang J. Khawanlang |
| Vice President - II    | Dr. Verinia G. Mawlong    |
| Joint Secretary        | Dr. Linda Bell Marbaniang |
| CDH Chairman           | Dr. Lumbor L. Mawson      |
| CDE Chairman           | Dr. Shailesh Pradhan      |
| Treasurer              | Dr. Lana E. Lyngdoh       |
| Editor                 | Dr. Nabaneeta Py Mawrie   |
| President Elect        | Dr. K.S. Sehdev           |
| E.C. Members           | Dr. Rimeo Nongtdu         |
|                        | Dr. Ronald C.B. Pyngrupe  |
|                        | Dr. Gideon W.R. Marak     |
|                        | Dr. Andrilla Dutta        |
|                        | Dr. Neelakshi Choudhury   |

# 1ST MEGHALAYA DENTAL CONFERENCE CUM SCIENTIFIC SESSION

## **ORGANISING COMMITTEE**

Organising Chairman :- *Dr. Freddy P. Nongkynrih*

Organising Secretary :- *Dr. Kyrpang Passah*

## **SCIENTIFIC COMMITTEE**

1. Dr. Kamalsingh Sehadave
2. Dr. Shailesh Pradhan

## **SOUVENIR COMMITTEE**

1. Dr. Neetu Py. Mawrie (Editor)
2. Dr. Verinia G. Mawlong
3. Dr. Heibor Challam
4. Dr. L. Lumbor Mawsor

## **RECEPTION COMMITTEE**

1. Dr. Lana E. Lyngdoh
2. Dr. Neelakshi Choudhury

## **TRAVEL & ACCOMODATION COMMITTEE**

1. Dr. L. Lumbor Mawsor
2. Dr. Ronald C.B. Pyngrope

## **PUBLICITY COMMITTEE:**

1. Dr. Mrinal Bhowmick
2. Dr. Rimeo Nongtdu
3. Dr. Andrilla Dutta
4. Dr. Raplang Kharwanlang

## **PROGRAMME**

**17<sup>th</sup> August, 2010**  
**Hotel Polo Towers, Shillong**

- 11:00 am - *Lighting of the Lamp*
- 11:10 am - *Welcome address by President IDA Meghalaya*
- 11:30 am - *Welcome Song*
- 11:45 am - *Speech by Special Guest*
- 12 noon - *Releasing of the Souvenir*
- 12:05 pm - *Speech by the Chief Guest*
- 12:30 pm - *Vote of thanks*
- 12:40 pm - *Lecture on "Practice Management"*  
*by Mr. Anup Abraham, faculty associate, IIM, Shillong.*
- 1:00 pm - *Lunch*
- 2:00 pm - *Scientific Session*
- 7:00 pm - *Banquet*

# Our Activities.....





Launching of our own IDA, Meghalaya chapter, helped us to realize some of our dreams and objectives for ourselves and our people, particularly the children. We have had several CDH and CDE programme under the banner of IDA. "Bright smile, Bright future" a project by Colgate helped us to cover 20,000. Children both in rural and areas. Awareness programmes were done and there after packets of tooth brush and tooth paste were distributed to the children.

## **CELEBRATING WORLD ORAL HEALTH DAY**

1. An awareness and Phone-In programme by Dr. N.Mawrie in Oooo La La FM Radio station.
2. On AIR by Dr. K.S. Sehdev.
3. School lectures at St. Marys and St. Anthonys by Dr. Fredy and Dr. Lumbor.
4. Media briefing through Doordarshan by Dr. M. Bhowmik.
5. Media briefing through local cable by Dr. K. Passah.
6. Press release.

## **CHILDREN DAY CELEBRATION**

A talk and dental check up given to the students of Laban Bengali Boys School by Dr. V. Pradhan. Dr. M. Bhowmik and Dr. L. Mawsor to mark the Children's Day Celebration by the IDA, Meghalaya Branch.

Dental awareness programmes and check up for the physically challenged children of St. Fernando School Umbir, and SOS Village by Dr. S. Pradhan, Dr. M. Bhowmik, Dr. N. Mawrie, Dr. L. Lyngdoh. Dr. Pynshngaiñ.

## **DENTAL AWARENESS PROGRAMME**

Talk on Dental Awareness and check up for the cadets of North Eastern Police Academy (NEPA) by Dr. N. Mawrie, Dr. D. Rumnong, Dr. D. Sood, Dr. L. Lyngdoh, Dr. M. Bhowmik and Dr. L. Mawsor.

## **REGISTRATION OF OUR BRANCH**

We are now formally registered with the Meghalaya State with the registration No. as SR/IDA - MB 28/10 of 2010.



## Certificate of Registration of Societies

Act XXI of 1860

NO. SR/IDAMB-28/10 OF 2010

I hereby certify that "INDIAN DENTAL ASSOCIATION

MEGHALAYA BRANCH, POLICE BAZAR, SHILLONG

has this day been registered under the Meghalaya Societies Registration Act,  
XII of 1983.

Given under my hand at Shillong

this FIRST day of the month of JULY TWO THOUSAND and  
TEN.

Registration fee of Rs. 250/- paid.

(L. KHARKONGOR)  
REGISTRAR OF SOCIETIES,  
MEGHALAYA, SHILLONG

## **CDES PROGRAMME OVER THE YEARS 2006-2010**

1. Diagnosis & Treatment of Pre Cancerous  
Lession by Lt. Col. H. Darekar
2. Cosmetic Tips : Veneers,  
Light Cures etc... by Dr. Mrinal Bhowmik
3. Management of Periodontal Cases  
in General Practice by Lt. Col. H. Darekar
4. Bleaching : Life to the Lifeless by Dr. K.S. Sehadave
5. Hands On Course on Implantology by Dr. Kamlesh Kothari  
of KADET Institute, Kolkata.
6. Seminar on Aesthetic Dentistry by Dr. Ajit Shetty &  
Dr. Sangmitra,  
Smile Care-Mumbai
7. Full Mouth Rehabitalition by Dr. Paresh Hale,  
Bangalore
8. Hands on Course on Pro-Tapered File by Dr. A. Saha, Kolkata
9. Glass Ionomer Cements by Dr. Ravindran, Chandigarh
10. Crown & Bridges by Dr. Deshpande, Mumbai

# Our Fraternity Tree.....



*"Grow we must" .....*  
*To remain Evergreen*

# Management of Periodontal defects with Alloplastic Bone Graft and Guided Tissue Regeneration: Three case reports.

*Dr. Daity Jyrwa, BDS,MDS.*

## **Abstract:**

The ultimate goal in periodontal therapy is creation of an environment that is conducive to maintain the patient's dentition in health, comfort, and function. Periodontal therapy is directed not only at inflammation control but also at pocket reduction and correction of associated bone defects. Hence, resorbability and the ability of a graft material to enhance osteoconduction are the reason behind the development of bone replacement grafts available today.

The aim of Regenerative periodontal surgery is to regenerate the attachment apparatus. Over the years a number of devices and materials have been made available to the dentist for regeneration of the lost periodontium. One such material is the use of alloplastic bone replacement grafts alone or in combination with barrier membranes to promote the restoration or reconstruction of the tissues destroyed. Barrier membranes is a type 1 collagen membrane derived from fish sources and available in various dimensions and it is nontoxic, nonallergenic and over all biocompatible.

Periodontal defects, such as Endo-Perio lesion, Intrabony defects and furcation involvement can be treated successfully by using with Alloplastic Bone Graft materials alone or in combination with Guided Tissue Regeneration (GTR). Both the materials shows to be favourable treatment option to treat for the periodontal defects. **Key words:** Periodontal defects, Alloplastic bone grafts, Guided tissue regeneration, Endo-perio lesion, Furcation involvement, Intrabony defects.

## **Introduction:**

Clinicians often opt to use bone biomaterials with the intent to support regeneration of periodontal tissues (Rosen et al. 2000). Bone derivatives or bone substitutes have been used alone or in combinations with guided tissue regeneration (GTR) with considerably variable outcomes (Trombelli et al. 2002, Needleman et al. 2006). The principles of GTR have been applied to resolve periodontal defects, such as intra-bony defects, furcation defects and combined endoperio lesion,(Cortellini & Tonetti 2000). Bone grafts have a potential to stimulate or support regeneration of periodontal structure. Most bone replacement grafts are osteoconductive, relatively inert filling materials, and integrate with new bone. Osteoconductive materials provide a scaffold to allow bone ingrowth and deposition and may support significant improvement in clinical probing depth and attachment levels. (Froum et al. 1983, Stahl et al. 1983). The main objective of GTR for successful outcomes are: (1) wound stability during the early healing sequence (Wikesjo & Nilve'us 1990, Haney et al. 1993); (2) space provision to allow the migration and proliferation of cells from the periodontal ligament and alveolar bone along the periodontally exposed root (Haney et al.1993, Sigurdsson et al. 1994, Trombelli et al. 1999, Wikesjo et al. 2003a); and (3) conditions favouring primary intention healing, i.e., the wound space remains protected from bacterial contamination and infection (Haney et al. 1993, Sigurdsson et al. 1994, Wikesjo et al. 2003b).GTR have been used widely for management of periodontal defects with the intension to support regeneration of periodontal tissue. To manage such cases requires complete removal of irritants from both the pulp and the defects area. Thus the treatment comprise of endodontic treatment of involved teeth as well as periodontal surgery by thoroughly debrided of the

specific region, followed by grafting of the bone graft to fill the defects and covered the bone graft with resorbable barrier membrane. This type of treatment modality will provide maximum benefit to the patient with less chances of failure. This article reviews the importance of GTR including alloplastic hydroxyapatite bone grafts for the treatment of combined endodontic-periodontal lesion and presents two case reports utilising this combined therapy.

GTR have been used widely for management of periodontal defects with the intension to support regeneration of periodontal tissue. To manage such cases requires complete removal of irritants from both the pulp and the defects area. Thus the treatment comprise of endodontic treatment of involved teeth as well as periodontal surgery by thoroughly debrided of the specific region, followed by grafting of the bone graft to fill the defects and covered the bone graft with resorbable barrier membrane. This type of treatment modality will provide maximum benefit to the patient with less chances of failure.

This article reviews the importance of GTR including alloplastic hydroxyapatite bone grafts for the treatment of Periodontal defects such as (1) combined endodontic-periodontal lesion, (2) Intra bony defects and (3) Furcation Involvement and presents three case reports utilising this combined therapy.

## **Materials and Methods:**

### **Case 1: "ENDO-PERIO LESION"**

A 21 years old male complaint of pain and swelling in relation to # 31, 41 and 42 and with the history of trauma 2 years back.

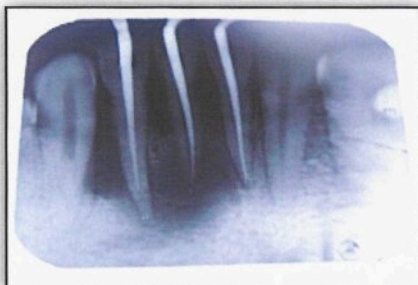
On Intra oral examination revealed 2 ° mobility of # 41, and 42. Probing pocket depth of 10 mm on the distal aspects of 42. Discoloration of 41 can be seen .

On radiographic finding it is seen that bone loss involving the apical region of # 31, 41, 42 extending the distal aspect of 42 (Fig -1). Patient medical history revealed no documented systemic problem and routine haematological investigation was found to be within normal limit.

Based on clinical and radiographic findings a treatment was planned Accordingly, including endodontic treatment and thorough debridement in relation to # 31, 41, 42.

Patient was under antibiotic coverage. After thorough scaling and root planing surgery was carried out under local anaesthesia of 1: 80,000 Adrenaline. Crevicular incision extending from 32 and 43 with vertical releasing incision was given distal to 32 and 43 to gain better access to the defects area. A Full thickness muco-periosteal flap was reflected and the defect was thoroughly debrided by removing all the granulation tissue and roots planned (Fig-2). Obturation of 31, 41 and 42 were done at the time of surgery. The defects was filled with alloplastic bone graft materials (hydroxyapatite granules) and resorbable membrane placed over the bone graft (Fig-3). Flap reflected back coronally and sutured using 3-0 non absorbable black silk (Fig-4). Periodontal Coe-pak was placed for comfort of patient. A postoperative instruction was explained to patient. Recall visit after 7 days for removing of the Coe-pak and suture. The healing was found uneventful.

The patient was asked to come for followed up appointments at 1 month (Fig-5). 3 month and 6 months postoperatively for clinical and radiographic evaluation. At 6 month, radiograph showed sign of bone formation in the defect area (Fig-6).



**Fig-1: Preoperative IOPA view. Fig-2: Flap reflected & debrided. Fig-3: Bone graft & membrane placed.**



**Fig-4: Sutures in position. Fig-5: Post operative view (1 month). Fig-6: Post operative IOPA view (6 months).**

#### **CASE- 2: "INTRABONY DEFECTS".**

A 30 years old lady reported with a complaint of pain, swelling and pus formation in relation to # 22 for the last one year.

On Intra oral examination revealed 2° mobility of # 22. Probing pocket depth of 15 mm on the palatal aspects of 22 ( Fig-1). According to findings the treatment was planned and endodontic treatment was carried at the time of surgery. Under local anaesthesia crevicular incision with full thickness flap was raised and thorough debridement done and it was detected that the defects was three walls defects of which grafting procedure can be of good treatment option (fig-2). The defects filled with Hydroxyapatite bone graft materials (Fig-3). Resorbable barrier membrane trimmed into desired configuration and placed over the bone grafts (Fig-4), and suture placed in position (Fig- 5).

Fig-1: Probing pocket depth of Fig-2: Flap reflected and debridement Fig-3: Bone grafts filled the 15 mm (palatal aspects on mirror). thoroughly done. defect.





**Figure- 4: GTR placed over the Bone grafts. Fig- 5: Flap reflected back coronally and sutured in position**

### CASE-3: "FURCATION INVOLVEMENT - GRADE II DEFECTS".

A 45 years old female complaint of pain and swelling and pus discharge in relation to # 36 for last 6 months.

On Intra oral examination revealed 2 ° mobility to # 36. Probing pocket depth of 10 mm on the buccal aspects of 36 (Fig-1).

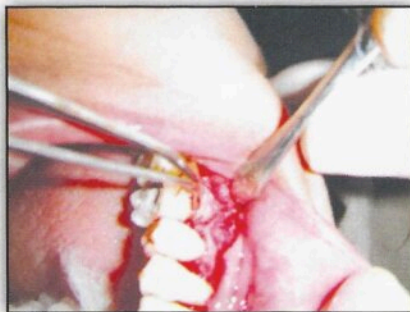
On radiographic finding it is seen that bone loss involving the Furcation region of # 36 (Fig-2). Patient medical history revealed no documented systemic problem and routine haematological investigation was found to be within normal limit.

Based on clinical and radiographic findings a treatment was planned accordingly, including endodontic treatment and thorough debridement in relation to # 36.

Surgery was carried out under local anaesthesia of 1: 80,000 Adrenaline. Crevicular incision extending from 31 to 38 given and full thickness muco-periosteal flap was reflected and thoroughly debrided by removing all the granulation tissue and roots planned (Fig-3). Obturation of 36 was done at the time of surgery or prior to surgery. The defects was filled with alloplastic bone graft materials (hydroxyapatite granules) and resorbable membrane placed over the bone graft (Fig-4). Flap reflected back coronally and sutured using 3-0 non absorbable black silk (Fig-5). Healing was found uneventful and on patient was asked to come for followed up appointments at 1 month 3 month and 6 months postoperatively for clinical and radiographic evaluation (Fig-6).



**Fig-1: Preoperative view-pocket depth. Fig-2: Pre-IOPA view X- ray. Fig-3: Furcation detected Of 10mm.**



**Fig-4: Bone graft and membrane placed.**

**Fig-5: Sutures placed.**

**Fig-6:**

**Post operative view (6 months).**

## Discussion

Periodontal therapy is directed not only at inflammation control but also at pocket reduction and correction of associated bone defects. Bone replacement grafts have been used to achieve this end. The ideal bone replacement graft should be able to trigger osteogenesis, cementogenesis and formation of a functional periodontal ligament. Osteogenesis, the formation of mineralized bone by transplanted osteoblasts, is only achieved with Autogenous grafts but the disadvantage is that it need a second surgical site to obtain the graft, (Schallhorn et al 1970). Demineralized Allogenic freeze-dried bone gained wider application, but there is a risk of disease transmission.

Alloplastic or synthetic hydroxyapatite is a resorbable, acting as a mineral reservoir inducing bone formation via osteoconductive mechanisms. Its reported advantage is the slow resorption rate, allowing it to act as a mineral reservoir at the same time acting as a scaffold for bone replacement. Observations of the material suggest good manageability, haemostatic properties, osteoconductive and also act as a barrier retarding epithelial downgrowth.

GTR provide wound stability during the early healing sequence, space provision to allow the migration and proliferation of cells from the periodontal ligament and alveolar bone along the periodontally exposed root and conditions favouring primary intention healing, i.e., the wound space remains protected from contamination. Surgical complication, mostly occurs if membrane exposure to oral environment. The use of bone replacement grafts, bone may augment outcomes through osteogenic and/or osteoconductive pathways whereas GTR devices are intended to provide an environment conducive to express the innate potential for periodontal regeneration.

## Conclusion:

Every attempt was made to save a tooth to maintain the esthetics and function, as far as possible. In cases of advanced bone loss and mobility, correct diagnosis and prognosis play a very important role along with treatment plan

A regenerative approach is ideal in that it not only has the ability to arrest disease, but also has the potential to reconstruct the lost periodontium. Although, regeneration has become a reality (Goldman et al 1986), complete and true regeneration is still a gold to be achieved.

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## **FAILURE OF ENDOTONTIC TREATMENT**

*Dr. S.Jhingran, B.D.S. Gauhati*

Failure of a Root Canal Treatment (RCT) has been a dogma affecting about 5% to 15% cases treated employing the principles of Endodontic management of tooth conservation. According to some studies 60% failure of RCT is due to iatrogenic reasons mostly attributed to unfilled canals. Failure of an Endodontic treatment generally happens within the first three years of treatment. The failure is mostly because of persistent intra-radicular and sometimes extra-radicular infection.

This article is an overview in analyzing the reasons for such failures and should help in a better understanding and subsequent improvement in the treatment of diseased tooth.

Failure of RCT could be due to :-

- (A) Failure to find a canal : One of the most common causes leading to an RCT failure is the inability of the operator to locate a canal and then leaving the canal unclean and unfilled thereby inviting a failure. Some studies have suggested 76% to 96% of all the upper first molars (6I6) have four canals usually a mesio-buccal 2(MB2) in addition to the palatal, mesio-buccal and the disto-buccal. MB2 canal is difficult to locate without special instruments and magnification. Such unlocated and untreated canal would always lead to a failed RCT. Mention must also be made of accessory canals usually found near the apex, which are difficult to find and fill.
- (B) Failure to Clean a canal (Chemo- Mechanical Preparation): Studies have demonstrated that part of the root canal space often remain untouched during the chemo-mechanical preparation regardless of the technique and instrument used. These untouched areas inside the canal system of a tooth may contain bacteria's and necrotic tissue substrate, which are ultimately responsible for a RCT failure.
- (C) Failure to fill a canal : Unusually shaped canals are very difficult to fill thereby leaving a space which can harbour bacterial colony and can lead to the sustenance of periradicular pathology. Sometimes even a constriction in the root canal can be difficult to negotiate and fill. Accessory or lateral canals are also very difficult to fill. Under-filled and overfilled canals can also lead to a failure of RCT, it has been seen that success rate goes down in cases with overfilled canals then in teeth with under filled canal. Technically speaking a over-filling has no co-relation with failure as most of the materials used to obturate a canal in modern day practice are biocompatible or show toxicity prior to setting expect for Para-formaldehyde containing materials. Sealer toxicity is significantly reduced or eliminated after setting therefore it is impossible for such materials to cause peri- radicular inflammation in the absence of concomitant endodontic infection.
- (D) Over instrumentation: Over instrumentation is an important factor that could result in the displacement of infected dentin or debris into the periradicular region causing localized inflammation and in the presence of microbes can cause a RCT to fail.
- (E) Coronal Sealing : Adequate and a perfect coronal seal is now considered mandatory for a RCT to be successful. Coronal leakage due to voids in the seal or permeation of infection through the permanent or temporary restorative material is a recipe for failure of a RCT. Failure of a RCT is usually due to presence of a mixed infection of which the Gram-negative anaerobic rods abound. Mention must be made of 'enterococcus faecalis', whose presence according to some estimate is

about 29% to 38% in failed RCT cases. These rods Gram-negative rods are highly resistant to several intracanal medicaments including calcium hydroxide and if a failure is established due to its presence the eradication is almost impossible with the conventional means. It has been established that inspite of a negative periapical culture prior to sealing of a root canal, *E.faecalis* has been found to have reached the periradicular region of an endodontically treated tooth months after the treatment and the reason attributed was an improper coronal seal.

- (F) Foreign Body Reaction: This has almost been overlooked as a possible cause for failure of RCT but is an important reason for causing an RCT to fail. Some Root canal filling materials may contain insoluble substances like talc contaminated G.P cones, which can produce a foreign body reaction. Cellulose, a vegetable content of some materials like cotton wool and paper points, is a stable polysaccharide of plant cell wall that is neither digested nor degraded by macrophages could elicit a foreign body reaction.
- (G) Perforations: Perforations, which sometimes inadvertently occur, is an endotontic mishap attributed more to the lack of skill of the operator rather than the procedure itself. Perforations are difficult to treat but with the advent of materials like MTA (Mineral trioxide- aggregate) it has now become easier to treat such cases.
- (H) Placement of final Restoration: Placement of final restoration should be done as quickly as possible preferably within a week so as to avoid contamination of the canal or the filler by saliva thereby introducing microbes into the canal system that can lead to the failure.

We can thus conclude that for an RCT to be successful...

- (1) Strict asepsis needs to be maintained during the treatment procedures.
- (2) Complete chemo-mechanical preparation of root canals using proper instruments in sequence and use of anti-microbial irrigants.
- (3) Proper and justified use of intra-canal medications
- (4) Adequate root canal filling
- (5) Proper coronal seal
- (6) Placement of coronal restoration as soon as possible.

A radiograph showing properly done RCT with adequate seal does not necessarily assure the success of an endodontic treatment. Broken instruments, perforations, under-filling, overfilling, ledges are not the direct causes of an RCT failure but the truth is such procedural errors or accidents only impedes successful and appropriate intra-canal procedures. Presence of viable bacteria that remain in the canal system always presents a constant risk of endodontic failure.

## **ACCREDITATION : IDA – DCI**

**Dr K.S. Sehdeva MDS**

### **Benefits of Accreditation**

Learning is a lifelong endeavor, especially in a world that is changing as quickly as ours. Those who have been in dentistry for many years can attest to the need for staying current with today's legal requirements, technology, practice tools and other areas critical to the practice of dentistry.

There are several benefits of participating in the IDA accredited Continuing Dental Education Programme:

- Accredited CDE Programmes ensure a standardised ,high quality level of instruction.
- The credit points earned cumulated can result in the awarding of a fellowship.
- 30 credit points per year will result in a fellowship awarded at the end of the 5 year period (150 credit points minimum)
- On completion of the 30 points- Dentists are provided with a white level I certificate.
- On completion of 60 points- Dentists are awarded with a silver level II certificate.
- On completion of 90 points- Dentists are awarded with gold level III certificate.
- On completion of 120 points- Dentists are awarded with platinum level IV certificate.
- On completion of 150 points- Dentists are awarded with a Fellowship certificate.
- The Programme offers a plethora of courses on all subjects ranging form clinical skill development to practice development strategies,such that dental professionals can have access to all subject courses under one Programme.
- The IDA CDE Programme provides all courses at nominal charges compared to other Programme providers.
- Dentists can access Programme details,subject choices and a vast speaker base by the click of a button.

### **Credit Allocation System**

*Calculation and assigning of credit points must be done as follows:*

- Credit must be awarded on the basis of contact hours.No credit for courses less than one hour in duration.
- For audio/visual self instructional programmes, individuals should receive credit equivalent to the instructional time of the programmes ,for a minimum of one hour of credit.
- Individuals who complete written self instructional programmes should receive a minimum of one hour of credit.
- For CDE onsite or in-office participation components, credit must be based on contact hours.
- For electronically mediated CDE, the provider must demonstrate a rationale for establishing credit hours to be awarded based on the nature and quantity of information provided.such courses must provide a minimum of one hour of credit

- No credit is awarded if the course is for less than 1 hour. Credit is allocated where active involvement by a participant is in at least 30% course content under the direct supervision of the course provider.

#### **Credit Allocation:**

- DENTISTS ARE EXPECTED TO COMPLETE 30 HOURS WORTH OF CREDIT POINTS PER YEAR
- On completion of the 30 points- Dentists are provided with a white level I certificate
- On completion of 60 points- Dentists are awarded with a silver level II certificate
- On completion of 90 points- Dentists are awarded with gold level III certificate
- On completion of 120 points- Dentists are awarded with platinum level IV certificate
- On completion of 150 points- Dentists are awarded with a Fellowship certificate

Credit is awarded based on the actual number of contact hours (excluding breaks, meals, registration periods) in case of formal structured lectures as under:

- A full day Lectures- 6-7 Credit hours
- Half day lecture - 3 Credit hours
- One hour lecture -1 Credit Hour (45 Min + 15 min Q/A)
- No credit is awarded if the course is for less than 1 hour.
- For Self Instructional Material (Print/Online), the course content has to be evaluated and pre-approved.
  - On successful completion of assessment, credit hours equivalent to study time are allocated.
- CDE credits are also allocated for self instruction from journals (e.g., JADA in USA).
- Credit is allocated to four articles in each issue of the Journal of the regulatory body as CE vehicle with questions/Online test form.
- If 3 out of 4 questions are correctly answered per article CE Credits of 0.5 hours per article and a maximum total of 2 credit points for each issue are awarded.

#### **Overall Recommendations**

- **The overall recommendations are as under:**
  - Accreditation of CDE providers by National Regulatory Authority- DCI along with State Councils
  - Registration renewals based on Credit hours earned after every 5 years
  - Total credit hours required for renewal 150 hours with minimum of 30 hours per year
  - Approved Course Providers conducting CDE with approved and recognized faculty with pre-approved course content.
  - Records to be maintained by dentists to be produced during renewal. Facility for random audits(sworn statements, affidavits, statement of compliance) by regulatory authority.
- **CDE to have hours allocated for mandatory subjects:**
  - HIV/ AIDS
  - Tobacco & Its Implications in Oral disease
  - Biomedical Waste Management

- Infection Control
- Management of Medical emergencies as related to Dentistry

- **Legal Issues**

- CDE points also allocated for original publications in Peer Reviewed Journals and for writing text books.
- 10 Credit hours for First Author
- 5 Credit Hours for Subsidiary Author
- All indexed journals published in India to have CDE content with questionnaires with paper/online feedback facility to earn credit hours.

- **All Local and State Branches must submit the list of dental professionals undertaking the CDE Programmes twice a year with their earned credit points, which will get reflected against the professionals name on the IDA website and updated.**

# Antimicrobial Drugs

Dr. BAREH PONCHEN

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Bhoirymbong CHC

They are some of the few curative drugs. As a class they are one of the most frequently used as well as misused drugs. They are designed to inhibit/kill the infecting organism and to have no/minimal effect on the recipient. This type of therapy is generally called Chemotherapy.

Antibiotics are substances produced by microorganisms, which supports the growth of or kill other microorganisms at a very low concentrations. They can be microbiologically or synthetically produced drugs now-a-days.

## Classifications:

### A. Chemical Structure:-

- 1) Sulfonamides and related drugs: Sulfadiazine and others, sulfones – D.D.S, PAS.
- 2) Diaminopyrimidines: Trimethoprim, pyrimethamine.
- 3) Quinolones: Nalidixic Acid, Norfloxacin, ciprofloxacin, ofloxacin, pefloxacin, etc.
- 4)  $\beta$  Lactam antibiotics: Penicillins, cephalosporins, monobactams, carbapenems.
- 5) Tetracyclines: Oxytetracycline, Doxycycline, etc.
- 6) Nitrobenzene derivatives – Chlorophenicol
- 7) Aminoglycosides: Streptomycin, gentamicin, etc.
- 8) Macrolide Antibiotics: Erythromycin, Roxithromycin, Azithromycin, etc.
- 9) Polypeptide antibiotics: Polymyxin – B, Colistin, bacitracin, etc.
- 10) Nitrofurantoin derivatives: Nitrofurantoin, Furazolidone.
- 11) Nitroimidazoles: Metronidazole, Tinidazole, etc.
- 12) Nicotinic acid derivatives: INH, PZA, Ethionamide.
- 13) Polyene antibiotics: Nystatin, Amphotericin – B, Filgrastim.
- 14) Imidazole derivatives: Miconazole, clotrimazole, ketoconazole, fluconazole.
- 15) Others: Rifampicin, Lincomycin, Clindamycin, Spectinomycin, Vancomycin, fusidate, cycloserine, viomycin, Ethambutol, Thiacetazone, clofazimine, Griseofulvin.

### B. Mechanism of action:-

- 1) Inhibit cell wall synthesis- Penicillins, Cephalosporins, Cycloserine, Vancomycin, Bacitracin.
- 2) Cause leakage from cell membranes: Polypeptides and Polyenes groups.
- 3) Inhibit protein synthesis: Tetracyclines, Chloramphenicol, Erythromycin, Clindamycin.
- 4) Cause misreading of m-RNA code and affect permeability – Aminoglycosides.
- 5) Inhibit DNA gyrase – Fluoroquinolones.
- 6) Interfere with DNA – function: Rifampicin and Metronidazole.
- 7) Interfere with DNA – synthesis: Idoxuridine, Acyclovir, Zidovudine.
- 8) Interfere with intermediary metabolism: Sulfonamides, Sulfones, PAS, Trimethoprim, Pyrimethamine, Ethambutol.

### C. Types of organisms against which primarily active:-

- 1) Antibacterial: Penicillins, Aminoglycosides, etc.
- 2) Antifungal: Griseofulvin, polyene, Imidazole – derivatives.
- 3) Antiviral: Idoxuridine, Acyclovir, etc.
- 4) Antiprotozoal: Chloroquine, Pyrimethamine, Metronidazole, Diloxanide, etc.
- 5) Anthelmintic: Mebendazole, Pyrantel, Niclosamide, Diethyl Carbamazine, Albendazole, etc.

**D. Spectrum of activity:-**

- Narrow Spectrum:- Penicillin G, streptomycin, Erythromycin, etc.
- Broad Spectrum:- Tetracyclines, Chloramphenicol, etc.

**E. Type of action:-**

- Bacteriostatics:- Sulfanamides, Tetracyclines, Chloramphenicol, Erythromycin, Ethambutol.
- Bactericidals:- Penicillins, Aminoglycosides, Polypeptides, Rifampicin, Cotimoxazoles, cephalosporins, etc.

**F. Antibiotics are obtained from:-**

- Fungi:- Penicillin, Cephalosporin, Griseofulvin.
- Bacteria:- Polymyxin – B, colistin, Bautixcin, Thyrothricin, Aztreonam.
- Actinomycetes:- aminoglycosides Tetracyclines, Chloramphenicol, macrolides, Polyenes.

**Problems that arise with the use of antimicrobial agents:-**

- 1) Toxicity
- 2) Hypersensitivity reactions
- 3) Drug resistance – Mutation, gene transfer, cross resistance
- 4) Superinfection (Suprainfection)
- 5) Nutritional Deficiencies
- 6) Making of an infection

**Choice of an Antimicrobial agent:-**

**a) Patient factors:-**

- i). Age
- ii). Renal and hepatic function
- iii). Local Factors (site of infection)
- iv). Drug allergy
- v). Impaired host defence
- vi). Pregnancy
- vii). Genetic factors (eg. G-6PD – deficiency)

**b) Organism related considerations:-**

- i). Clinical diagnosis itself directs choice of the drugs.
- ii). A good guess can be made through experiences.
- iii). Choice to be based on bacteriological examination – culture and sensitivity test.

**c) Drug factors:-**

- i). Spectrum of activity
- ii). Type of activity
- iii). Sensitivity to the organism
- iv). Relative toxicity
- v). Pharmacokinetic profile
- vi). Route of administration
- vii). Evidence of clinical efficacy

**Combined use of Antimicrobials:-**

More than one drugs are frequently used concurrently. The objectives of using antimicrobials combinations are:-

- 1). To achieve synergism (additive/ supra additive effect or action). This is to decrease the MIC (Minimum Inhibitory concentration) of one drug in presence of another. Eg:-

- Two bacteriostatic agents are often additive– Sulfonamide + trimethopium (cotimoxazole)



-Tetracycline + Chloramphenicol or erythromycin, etc.

- Two bactericidal drugs are often additive:-
  - Penicillin/ampicillin + S/M or Gentamycin for S.A.B.E
  - Carbexicillin/ Ticarcillin + Gentamycin for pseudomonas in Neutropenic patients.
  - Ceftazidime + Ciprofloxacin in orthopedic prosthesis.
  - INH + Rifampicin in T.B
- Combination of a bactericidal with a bacteriostatic drug may be:-
  - Synergistic if the organism has low sensitivity to the cidal drug –  
Eg: Penicillin + Sulfonamide for antinomycosis  
Streptomycin + tetracycline for brucellosis  
Streptomycin + Chloramphenicol for K. Pneumonias  
Rifampicin + Isoniazid in Leprosy
  - Antagonistic if the organism is highly sensitive to the cidal drug because cidal drugs act primarily on rapidly multiplying bacteria, while the static drugs retard multiplication. Eg:- Seen in penicillin + tetracycline/Chloramphenicol on pneumococci; penicillin + erythromycin for Group A Streptococci and Nalidixic Acid + Nitrofurantoin for E. Coli.

2). To reduce severity or incidence of adverse effect – eg:

- Streptomycin + penicillin G for S.A.B.E (Strep faecalis)
- Amphotericin B + Flucytosine: shorter course is needed, specially for cryptococcal meningitis.

3). To prevent emergence of resistance.

- Sulfonamide + streptomycin – H. Influenzae
- Rifampin + Ciprofloxacin – Staph. Aureus

4). To broaden the spectrum of antimicrobial action:- In treatment of mixed infection, severe infection and topical application.

Chemoprophylactic use of antimicrobials:-

- Penicillin G – Rheumatic fever (Strp)
- INH + or Rifampin – T.B
- Rifampin/Sulfadiazine/Quinolones – M. Meningitis
- Procaine penicillin – Gonorrhoea/syphilis
- Tetracyclines – Rickettsial infection (endemic/epidemic scrub Typhus, etc).
- Chloroquine – Malaria
- Amantadine – Influenza A<sub>2</sub>
- Penicillin/cephalosporine – few hours before and after – Dental extraction, Tonsillectomy, Endoscopies, etc.
- Dirty contaminated wounds (Road side accidents, etc) : Ceftriaxone 1gm iv. Every 12 hourly or Ampicillin (2gm iv. 6 hourly) + inj. Gentamicin (80mg i/v/im. 8 hourly) + Metronidazole (0.5gm iv. 8 hourly) or clindamycin (0.6gm iv. Every 8 hourly) may be used.

Some of the commonly used antimicrobials are shown below along with their doses:-

- i) Sulfadiazine – Meningitis – Dose: 0.5gm QID/2gm TDS
- ii) Sulfamethoxazole – dose: 1 gm B.D. for 2 days and 0.5gm BiD.
- iii) Cotrimoxazole (Sulfonamide + trimethoprim)  
Trimethoprim + sulphamethoxazole = 80mg : 400mg (SS)  
X 1 tap X BiD = 160mg : 800mg (D/S)

Uses: U.T.I, R.T.I, Typhoid, GIF infection, Chancroid, Gramloma Inguinale, Pneumocystis carinii, malaria.

S/E: of sulfonamides/cotrimoxazole

- Nausea, vomiting, epigastric pain
- Crystalluria – minimize by taking plenty of fluids and by alkalinizing the urine.
- Hypersensitivity reaction – eg: urticaria
- Kernicterus in newborn
- Haemolysis in G-6-PD patients

Interaction: Enhance action of phenytoin, tolbutamide and warfarin.

- iv) Nalidixic Acid: dose 0.5 -1 gm T.D.S or QID  
(Gramoneg) – in U.T.I/diarrhoea due to proteus, E.Coli, shigella/salmonella.
- v) Fluroquinolone (First generation – Norfloxacin, ciprofloxacin, ofloxacin, perfloxacin. 2<sup>nd</sup> generation – Lomefloxacin, sparfloxacin, etc). – highly susceptible organisms – E.Coli, K. pneumonia, Enterobacter, Salmonella typhi, other Salmonella, shigella, proteus, N. Gonorrhoea, N. Meningitidis, H. Influenzae, H. Ducreyi, Campylobacter jejuni, yersinia enterocolitica, vibrio cholera, Aeromonas  
  - Moderately susceptible – pseudomonas, staph: aureus (MRSA), Mycobacterium, tuberculosis, etc.

Doses:- differ from one molecule to another and from one organism to another. Therefore, please refer to any textbook.

Eg: - Ciprofloxacin 250-500mg Bid  
 - Ofloxacin 200-400mg O.D  
 - Etc.

vi) Beta-lactam Antibiotics

- a) Penicillin G (Benzyl Penicillin) – More effective for Gram +ve organisms. Resistance occurs due to presence of penicillinase in the organisms that inactivates the drug.
  - Sod. Penicillin G inj: 0.5-5M.U. i/m/iv. 6-12 hourly.
  - Pot. Penicillin G (oral) 2-8lac U. QID. A.c. (pentid)
  - Procaine penicillin G inj.(3 lac.u. procaine penicillin + 1lac u.sod. penicillin G) to provide rapid as well as sustained blood level.
  - Benzathine penicillin (long acting) .6-2.4M.U. i/m 2-4 weeks – usually for prophylaxis.

\*Penicillin is very safe drug except for Hypersensitivity. Therefore, skin test is a must for administration.

- Phenoxymethyl penicillin (Penicillin V) – it differs from PnG only in that it is acid stable (suitable for oral use)  
Dose: 250-500mg 6 hourly (250mg = 4 lac U)
- b) Penicillinase resistant penicillins
  - Cloxacillin – 0.25 – 0.5gm orally 6 hourly or 0.25 – 1gm i/m or iv
- c) Extended spectrum penicillins:- (Broad spectrum) - +ve and –ve organism.  
Ampicillin 0.5 – 2gm oral/iix/iv. 6 hourly (25-50mg/kg/dy)
  - Amoxycillin (oral absorption better compare to ampicillin): 0.25 – 1gm T.D.S
- d) Carboxy Penicillins: It is effective against pseudomonas aeruginosa and indole positive proteus. It is inactivated if given orally.
  - Carbenicillin: 1-2gm i/m or 1-5gm iv 4-6 hourly
- e)  $\beta$  lactamase inhibitors:-
  - Clavulanic acid – It is used along with Amoxycillin for synergistic effect- against MRSA and other organisms.
  - Amox. 250mg +clavulanic Acid 125mg or double the dose T.D.S

- Amox 1gm + Clav. 2gm/.5gm + .1gm deep i/m or iv 6-8 hourly

- Sulbatam – combined with ampicillin (Parcuteral use)  
Amp 1gm + salbalt 0.5mg deep i/m or iv 6-8 hourly

f)

Cephalosporins:

- First generation – cefazoline (injectable), oral – cephalaxin, cephadrine, cefadroxil.
- Second generation – cefuroxime (injectable) oral – cefaclor, cefuroxime oxetil
- Third generation – parenteral '!cefotaxime, ceftizomine, cefuazone, ceftuzidime and cefoperazone. Oral '!cefixime.
- Fourth generation – Parenteral '!cefepime and cefpirome
- Cefazolin (Klebsiella and E. coli monthly)  
Dose: 0.25gm 8 hourly (mild cases), 1gm 6 hourly (severe) i/m or iv
- Cephalaxin (it is less effective against penicillinase producing staphylococci and H. influenza)  
Dose: 0.25-1 gm 6-8 hourly (25-100mg/kg/day)
- Cefadroxil (has tissue penetration and exert more sustained action)  
Dose: 0.5-1gm B.D. (30mg/kg/day/D.O. B.i.D)
- Cefuroxime – 750-1,500mg i/m/iv 8 hourly (30-100mg/kg/day)
- Cefaclor – (H.Influenzae, E.Coli, Pr. Mirabilis)  
250-500mg T.D.S/Q.i.D (20-40mg/kg/day P.O. T.D.S)
- Cefotaxime – (Gram negative organism – in Meningitis – high CSF level) – 1-2gm i/m or iv. 8-12 hourly (100-150mg/kg/day and 200mg/kg/day in case of meningitis in divided doses).
- Ceftozoxime (both gram +ve and –ve org) – 1-2gm i/m or iv. 6-8 hourly (150mg/kg/day i/m or iv. Divided doses T.D.S).
- Ceftriazone (both gram +ve and –ve ): 1-2gm i/m or iv. O.D: meningitis 4gm followed by 2gm iv (75-100mg/kg) O.D.x 7-10 days: typhoid – 4gm iv. Daily x 2 days followed by 2gm/day (75mg/kg) till 2 days after fever subside.
- Ceftazidime (high activity against pseudomonas) 1-2gm i/m or iv. 8-12 hourly (100-150gm/kg/day divided doses)
- Cefoperazone (stronger action against pseunodomonas) 2-4mg i/m or iv. 8-12 hourly (100-150mg/kg/day divided doses)
- Cefixime (highly active against enterobacteriaceae, H. influenza, S. Pyogenes, S. Pneumoniae)  
200-400mg/day P.O divided 12 hourly (8mg/kg/day P.O divided B.i.D)
- Cefpirome (use in serious and hospital acquired infection – HAI – more potent against gram +ve and some gram –ve bacteria)  
Dose: 1-2gm iv./i/m 12 hourly (Cefrom 1gm inj)  
Interaction of the group: with probenecid, alcohol.

Broad spectrum Antibiotics:-

1. Tetracyclines (Tetracycline, Oxytetracycline, Demeclocycline, methacycline, Lymecycline, Doxycycline, Minocycline) – used in mixed infection, reneveal diseases, chlamydial, mycoplasma, pneumonia, cholera, brucellosis, plague, relapsing fever, rickettsial – S. typhus, RMSF, Q-fever, etc.
  - 250-500mg T.D.S. ½ hour before or 2 hours after food (milk, antacid, calcium, iron preparation should not be given together)
  - Doxycycline: 100mg O.D or B.i.d
  - Minocycline: 50mg/100mg O.D
  - Lymecycline: 300mg O.D

- Demeclocycline 150mg or 300mg O.D

S/E: Discoloration of teeth in case of children, liver toxicity, kidney damage, diabetes insipidus (demeclocycline), Vestibular toxicity, not to be used in pregnancy and children.

2. Chloramphenicol: (Like tetracyclines, it is inactive against mycobacteria, pseudomonas, protein, viruses and fungi).

Valid indication:-

- Enteric fever: .5gm 6 hourly till fever subsides and then .25gm 6 hourly to complete 14 days. It does not prevent or cure carrier state.
- Typhus/RMSF (Rickettsial): .5gm 6 hourly P.O (50-100gm/kg/day in 4 divided doses) x 5 days and 2-4 days after fever subside to prevent relapse.
- H. Influenzae meningitis/diplococcic meningitis: 75-100mg/kg/day in 4 divided doses iv.

S/E: Bone marrow depression (gray baby syndrome) – blood count should be examined regularly when in use.

Interaction: Inhibits tolbutamide, chlorpropamide, warfarin, cyclophosphamide and phenytoin. But phenosbitone, phenytoin, rifampin enhance chloramphenicol metabolism – reduce its concentration.

Aminoglycoside antibiotics:-

1. Streptomycin: uses in T.B, S.A.B.E, plague, tularemia.
  - T.B: 75-1 gm i/m x O.D for 30-60 days (children 20-40mg/kg/day)
  - Acute infection: 75-1 gm i/m x B.i.D x 7-10 days
2. Gentamycin: (Broader spectrum – PS. Aeruginosa, proteus, E. coli, klebsiella, enterobacter, serratia)  
Dose: 2-5mg (children) and 3-6mg/kg/day (adult) in divided doses i/m B.i.D/T.D.S.  
Now-a-days, it is more often used along with penicillin instead of streptomycin in S.A.B.E
3. Amikacin: (Same as gentamycin, though it is more potent)  
Dose: 15mg/kg/day in divided doses.  
7.5mg/kg/day in divided dose for U.T.I.
4. Tobramycin (identical to Gentamycin but more active against Pseudomonas and Proteus)  
Dose: 1-2.5mg/kg/day (children) divided 8 hourly/12 hourly iv. im  
3-6mg/kg/day (adult) divided 8 hourly i.v/im
5. Sisomicin and Nelilmycin (same as Gentamycin)
6. Neomycin (due to high toxicity, it is not used and (Framycetin) systematically and poorly absorbed in G.I.T)

Dose: 0.25-1 gm Q.i.D oral and 0.3-0.5% Topical.

Framycetin Topical 1% skin, 0.5% eye drop or oint.

S/E:

1. Ototoxicity – both cochlear and vestibular damages.
2. Nephrotoxicity – as tubular damage
3. Neuromuscular blockage – reduce the ACh – release from the motor endings. Therefore, myasthenic weakness is accentuated.

Macrolide antibiotics:-

1. Erythromycin – As alternative to penicillin, as a first choice drug for mycoplasma pneumoniae, legionnaire and pneumonia, whooping cough. As second choice in campylobacter enteritis, chancroid, Chlamydia trachomatis.

Dose: 250-500mg 6 hourly (30-60mg/kg/day)

S/E: hepatitis due to estolate ester.

Newer Macrolides:-

2. Roxithromycin: Semi-synthetic drug, long acting acid stable and more potent.

Dose: 150mg BID 30 mins before meal.

(2.5-5mg/kg BD)

3. Clarithromycin: It also acts against mycobalt. Avium (MAC), a typical mycobacteria, mycobalt. Lepros and some anaerobes (but not B.Fragitis)
4. Azithromycin: It is more active against H.Influenzae but less active against gram positive cocci. High activity on resp. pathogens – Mycoplasma, Chlamydia, Legionella, Moraxella, N.Gonorrhoea and campylobacter and mycobalt. Avium (MHC)  
Dose: 500mg O.D. (10mg/kg/day) x 3days x A.C.  
(Chlamydial and gonococcal single dose 1gm).  
S/E: with newer drugs, there are less S/E and more safer with Azithromycin.

**Other Antibiotics:-**

1. Clindamycin: it is reserved for anaerobic and mixed infections, especially B. fragilis. Erythromycin antagonizes its action.  
Dose: 150-300mg Q.i.D orally/200-600mg i.v 8 hourly.  
(Lincomycin is a forerunner of Clindamycin)
2. Vancomycin: it is a glycopeptides antibiotic- efficacy against MRSA, Strep. Viridans, enterococcus and c. difficile, gram positive-cocci, Neisseria, clostridia and diptheroids.  
Dose: 500mg 6 hourly or 1gm 12 hourly i.v. over 1 hr.  
S/E: High toxicity- nerve deafness which is permanent, kidney damage, red man syndrome (chill, fever, urticaria and intense flushing)
3. Polymyxin B: active against Gram negative bacteria (except proteus, serratia, neissoria)  
Dose: not absorbed orally. Systematic use is very toxic.  
Local preparation: Neosporin powder – 5000U  
Neosporin eye drop – 5000U  
Neosporin ear drop – 10,000U
4. Colistin: Very effective against pseudomonas, salmonella and shigella (diarrhea).  
Dose: colistin sulphate 25-100mg T.D.S. oral (walamycin 12.5mg/5mldry syrup). No absorption in G.F.T. (children: 5-15mg/kg/day). It is also used in cystic Filomias of Lung infection as aerosolized antibiotic with ultrasonic nebulizer 20-40mg.
5. Bacitracin: Effective mainly gram +ve organism (both cocci and bacilli). It is not absorbed orally. It is not used systematically because of high toxicity.  
Local use: nebasulf 250U/gm powder; Neosporin 400U/gm.

**Anaerobic Infection in Dental Field:-**

- Some species of Enbacterium (E.Brachy, E.Timidum, E.Nodatum) are commonly seen in periodontitis.
- Bifidobacterium presents in large number in mouth.
- Bacteriodes – porphyromonas – P. gingivalis – Pr. Periodontal diseases, P. Eudodontalis causing dental root canal infections.
- Fusobacteria, Spirochetes – ulcerative ginginitis (Vincent's)
- Dental Abscess, cellulites – Mouth anaerobes.
- Abscess and sines of jaw – Actinomycetes, and other mouth anaerobics.

**Treatment:** All anaerobic infections are sensitive to penicillin group, chloramphenical and metronidazole but resistant to aminoglycosides (streptomycin, gentamycin, etc)

Having seen the specificity, spectrum of action, toxicity, compliance and of course price of antibiotics; their uses should be judged judiciously and adequately to avoid development of drug resistance and toxicity and unnecessary expenditure.

# ***Oral Cancer: Etiology, Pathogenesis, Case Profile in Civil Hospital Shillong, department of Radiation Oncology and General Management.***

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The oral cavity consist of the upper and lower Lips, Gingivo Buccal sulcus, Buccal mucosa, upper and lower Gingiva, Hard palate, Floor of Mouth the Anterior 2/3 of Mobile tongue.

More than 95% of the Carcinoma of the Oral Cancer is of Squamous cell type in nature.

They constitute a major health problem in developing countries, representing a leading cause of death. The survival index continues to be small (50%), as compared to the progress in diagnosis and treatment of other malignant tumours. According to World Health Organization, Carcinoma of oral cavity in males in developing countries, is the sixth commonest cancer after lung, prostate, colorectal, stomach and bladder cancer, while in females, it is the tenth commonest site of cancer after breast, colorectal, lung, stomach, uterus, cervix, ovary, bladder and liver. [1]



Since, the oral cavity is more accessible to complete examination; it could be used in early detection of precancerous and cancerous lesions. But either due to ignorance or inaccessibility of medical care, the disease gets detected in the later stages. Thus, there is a need for improvement in early detection of oral carcinomas, because in the initial stages, treatment is more effective and the morbidity is minimal.

One method that is currently being investigated, utilizes in-vivo toluidine blue staining with oral brush biopsy, for diagnosis of premalignant lesions, enabling the clinician to choose the patient for scalpel biopsy. [2] This test is available in Shillong.

Most invasive oral carcinomas are preceded by a pre invasive stage, that may last for many years. Tumours progressive in epithelia has been classified as normal, hyperplastic (non-dysplastic), dysplastic carcinoma in situ and invasive carcinoma. [3] The majority of the initial alterations of precancerous and cancerous oral lesions are not readily recognizable, on clinical or histopathological examination. The basic biology of initiation and progression of these tumours is still obscure.

## **EPIDEMIOLOGY AND ETIOLOGY**

Overall incidence and mortality attributed to oral squamous cell carcinoma (OSCC) is increasing, with current estimates of age-standardized incidence and mortality of 6.6/100,000 and 3.1/100,000 in men and 2.9/100,000 and 1.4/100,000 in women, respectively. [1] Recent studies confirm that Oral cancer forms a large part of the cancer load in part of India. [3] Tobacco and alcohol are the two most important known risk factors for the development of oral cancer. [5] Cofactors in OSCC include dietary factors, immunodeficiency and viral infections like HPV 16/18.

## **RISK FACTORS FOR ORAL CANCER**

The risk factors include tobacco associated intra-oral carcinogens, which may play a synergistic role in oral tumorigenesis. From relative risk factors of alcohol and tobacco, it has been estimated, that 75% of all oral cancers are preventable. In the remaining 25% of patients who are not exposed to these substances, the cause/s of their tumours remains unknown. <sup>[6]</sup> The disproportionately higher incidence of carcinoma of the head-neck in relation to other malignancies in India, may be due to use of tobacco in various forms, consumption of alcohol, low socioeconomic condition related to poor hygiene, poor diet and rampant viral infections. <sup>[7]</sup>

### **TOBACCO**

Oral Neoplasia has been associated with chewing of tobacco with betel quid (BQ) in India and other Asian countries, whereas in Western countries, cigarette smoking and heavy alcohol consumption are the main risk factors. <sup>[8]</sup> The International Agency for Research on Cancer (IARC) confirmed that smoking of various forms of tobacco (e.g., bidis, pipes, cigars and cigarettes) is carcinogenic in humans. <sup>[9]</sup> Chewing of tobacco with BQ increases exposure to carcinogenic tobacco-specific nitrosamines (TSNA) and to nitrosamines derived from areca nut alkaloids. Furthermore, reactive oxygen species (ROS) implicated in multistage carcinogenesis, are also generated in substantial amounts in the oral cavity during chewing. Tobacco smoke pro-carcinogens such as benzo-[a]-pyrene, are metabolized by oxidising enzymes, particularly cytochrome *p450*, some resulting in the production of reactive carcinogenic intermediates. Some studies link that cytochrome P450 family 1, subfamily A (CYP1A1) and CYP2E2 genotype shows susceptibility to oral cancer, but others have failed to confirm this association. <sup>[10]</sup>

### **BETEL QUID AND ARECA NUT**

Betel chewing is reported to be the most important etiological factor in oral submucous fibrosis. The use of betel quid, containing both areca nut and tobacco, is associated with a much higher relative risk of oral cancer, between 8-15 times as compared to that of 1-4 times, associated with using the quid, without tobacco. <sup>[8]</sup> BQ chewing produces ROS that is detrimental to oral mucosa and can be directly involved in tumour initiation process, by inducing mutation, or by making the mucosa susceptible to BQ ingredients and environmental toxicants. Betel quid (BQ) chewing produces reactive oxygen species (ROS), that have multiple detrimental effects upon the oral mucosa. The production and release of ROS occurs under alkaline conditions during the auto-oxidation of areca nut (AN) polyphenols, in the BQ chewers saliva. <sup>[11]</sup> The ROS can be directly involved in the tumour initiation process, by inducing genotoxicity and gene mutation, or by attacking the salivary proteins and oral mucosa, leading to structural change in the oral mucosa, that may facilitate the penetration by other BQ ingredients and environmental toxicants. The nitrosamines occur in the saliva of BQ chewers. <sup>[12]</sup> These AN-specific nitrosamines are mutagenic, genotoxic and capable of inducing tumours in animal models. <sup>[13]</sup>

### **ALCOHOL**

Alcohol, acting both independently as well as synergistically with smoking, has been implicated in oral carcinogenesis. <sup>[14]</sup> More importantly, alcohol may act as a solvent and enhance the penetration of carcinogens into target tissues. Acetaldehyde, which is the alcohol metabolite, has been identified recently as a tumour promoter. <sup>[15,16]</sup>

## **VIRUSES**

Another risk factors is human papillomavirus (HPV), which is also closely associated with benign and malignant oral lesions. This virus is detected in condylomas, focal epithelial hyperplasia, squamous cell Papilloma and malignant oral lesions. HPV positivity is higher in tumours from the oral cavity(59%), pharynx(43%) and larynx(33%).<sup>[17]</sup> Among those, only a small fraction of HPV-infected lesions rarely proceed to malignant transformation, specially those with HPV subtypes 16,18.<sup>[18-21]</sup> Hence, these studies indicate that tumorigenic conversion requires the presence of other risk factors.

## **DIET**

The importance of diet and nutrition in oral neoplasia has been indicated in several epidemiological studies.<sup>[22,23]</sup> Fruits and vegetables (high in vitamins A and C) are described as protective in oral neoplasia, whereas meat and red chilli powder are thought to be risk factors. Although the individual micronutrients responsible have not been formally identified, vegetables and fruits that protect against oral cancer and precancer, are rich in b-carotene, vitamin C and vitamin E, with anti-oxidant properties. Iron deficiency, resulting in oral epithelial atrophy and the Plummer-Vinson (Patterson Brown Kelly) syndrome, is associated with cancer of upper air and food passages and dietary iron may play a protective role in maintaining the thickness of the epithelium.<sup>[24]</sup>

### ***Case profile at Civil Hospital Shillong Department of Radiation Oncology , retrospective analysis of cases for the year 2009, brings out the following:-***

Out of the total cases 637, 233 are Head & Neck Cases and 53 occur in the Oral Cavity. Female are more afflicted than male. The breakup of Cases throws a very intensity figure:

|                         |                            |
|-------------------------|----------------------------|
| Ø Buccal Mucosa         | - 18 (Male-11, Female-07)  |
| Ø Lower Alveolus        | - 14 (Male-01, Female-13)  |
| Ø Lateral Border Tongue | - 07 (Male-04, Female-03)  |
| Ø Hard Palate           | - 04 (Male-01, Female-03)  |
| Ø Lip                   | - 04 (Male-02, Female-02)  |
| Ø Soft Palate           | - 02 (Male-02, Female-NIL) |
| Ø Anterior Tongue       | -02 (Male-01, Female-01)   |
| Ø Floor of Mouth        | -02 (Male-01, Female-01)   |

## **Clinical Presentation:**

In the early stage the presentation are usually a kankerous sore, teeth bite and in the late stage as an ulcer, swelling, fungating lesion. Cancer of the Oral Cavity in own area, which can be easily viewed by the individual and the physician, 50 % of our cases came in stage IV, with invasion of the bone, skin ulcer or trismus. It takes 1 year to 3 years for a pre cancerous lesion to turn malignant.

Figure 1 and 2 are the commonest presentation in Civil Hospital Shillong.

## **Management**

Investigation: Cancer of the Oral Cancer, is a locality invasive tumour. Investigation defining the local extension will be sufficed.

### **Preparation for Radiation Treatment:**

Cancer Oral Cavity is resistant to Radiotherapy or Chemotherapy. Surgery plays a pivotal role in the form of curative or salvaged mode. With reconstruction surgery, the disfigurement can be minimised.

### **Role of Radiation Therapy:**

Radiation Therapy has been used, as curative treatment, where surgery is not possible, due to various reasons. The dose employed is 60-70 Gray. It has been use also as Cytoreduction prior to surgery and after surgery.

### **Chemotherapy:**

Chemotherapy has limited use in Cancer Oral Cavity, except as an Anterior Chemotherapy or in combination with radiation Therapy. The commonly use drugs is Cisplatin and Flouracil

### **Preparation for treatment:**

Consultation with the dental surgeon; for oral preparation is mandatory, which directly affects the morbidity of the patients. Preservation of salvaged teeth and extraction of non salvaged teeth and total Prophylaxis should be carried out for all patients. Patients above 55 years of age will benefit from total extraction. Healthy oral cavity should be aimed before treatment is being planned.

### **Conclusion:**

The predisposing factor of the Cancer Oral Cavity is Tobacco, Betel nut, Betel leave and alcohol which are preventable causes. It takes 1 year to 3 years, for a pre malignant to turn malignant. The Oral Cavity is one of the sites where self detection is possible and where costly instrument are not necessary for assessment by a physician. With education and awareness 40-50 % (National Cancer Control Programme) and according to WHO is 70%, of the Cancer Oral Cavity can be prevent and most of the cases can be detected at an early stage which will lead to high cure rate. The present scenario is very depressing. The situation can be improved by mass awareness, good detection facilities and a good team of Surgeon and Radiation oncologists with well equipped operation theatre and radiation therapy, including Brachytherapy facilities.

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