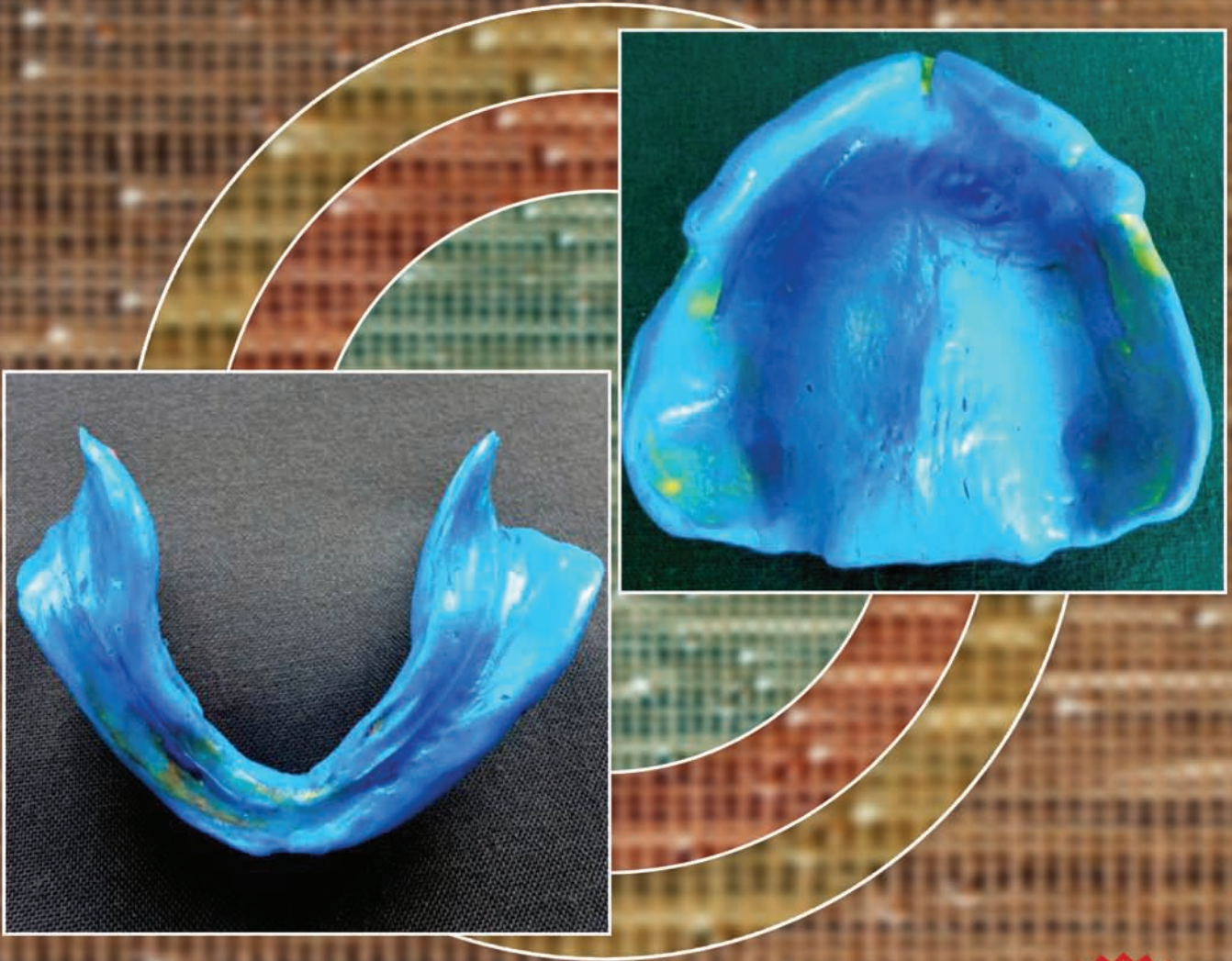


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Attingal Branch



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Indian Dental Association
Attingal Branch

Office:

The Editor-In-Chief,
Impressions-Journal of IDA
Attingal Branch,
Prathyusha Dental Care
IIIrd Floor YCDC, Opp
Vydyuthi Bhavanam, Pattom,
Thiruvananthapuram-695004.

Mobile : 9447060374

e-mail: journalidaatl@gmail.com

President's Message



Dear friends,

Warm greetings from IDA Attingal branch.

Glad to acknowledge that the third issue of current year's journal is getting released. Hats off to the journal editor Dr Pradeep Dathan. Its really a herculean task to do so.

We are just recovering from the terror caused by the floods. We all know, sparing three districts, rest were badly affected. Our State President elect Dr Abhilash made a visit to some of the affected clinics. What we inferred from his visit was really saddening. Some of the clinics were beyond repair, others needs a huge sum to get back to its original shape.

We, IDA Attingal was the first local branch to donate to IDA State flood relief fund. In this time of despair we are indebted to do more to our fraternity. At this point, I request each and every member to stand by our branch for this noble cause.

Thank you

Jai IDA.

Thanking you all,

Dr Ramesh S

President

IDA Attingal Branch.

Secretary's Message



Dear Members,

Seasons Greetings

The impact of natural disasters are beyond the imagination of man. Rs 25,000 crore would be 'non plan' cost to refurbish kerala. So many dental clinics were affected by the flood. IDA KSB extends financial aid to our fellow dentists by starting IDA RELIEF FUND. We have managed to raise a sum of Rs 100000/- as initial contribution. With more and more contribution from our magnanimous members, I hope to collect more amount in near future..

IDA launched HOPE Medi for our members and HOPE Assure for dental clinics. All the loss caused to the clinics due to natural calamities, fire etc can be covered by HOPE Assure.

In the next conference one of our dearest branch member, Dr Abhilash GS will be inducted as the PRESIDENT of IDA Kerala State. I request all members of our branch to be there to witness the prestigious moment. All of your sincere cooperation is expected in the upcoming conference to be held in 2021.

Thanking you,

Dr Anil Kumar D.
Honorary Secretary
IDA Attingal Branch.

ABOUT IDA ATTINGAL

IDA Attingal, symbolizes & represents, updates & educates, promotes & supports the local dental community of erstwhile Attingal, in delivering, quality dental health care to the general public. Maintenance of proper standards & ethical manner in practice, better interpersonal relations, as well as willingness to share knowledge, among members, has provided a high degree of respectability to the organization. Effective follow up of organizational proceedings at the state & national level by the branch executive, ensures that the members are kept abreast of all IDA activities. Regular representation at IDA events & healthy interaction with other branch members, has made IDA Attingal quite popular & a force to reckon. Adding to this would be a plethora of eminent leaders from the branch, who have raised to higher echelons in IDA. Through various Scientific programmes, presentations, journals & newsletters, the branch creates awareness of the latest advancements in dentistry, among members.

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A chance to become a friend in need

Kerala witnessed an unprecedented flood situation during this monsoon season. We lost nearly 483 precious human lives and a million people were displaced. All 14 districts of the state were placed under red alert. According to the Kerala Government, one-sixth of the total population of Kerala had been directly affected by the floods and related incidents. Circumstances forced the authorities to open thirty-five dams out of the fifty-four for the first time in the history of the state which augmented the suffering to unimaginable proportions. The National Crisis Management Committee coordinated the rescue and relief operations along with local residents and the dedicated fishermen. The situation was regularly monitored by the Prime Minister, and he assured all assistance from the center to our Chief Minister. Almost all the districts in Kerala were badly affected making life nearly impossible to many.

The districts of Trivandrum and Kollam were the least affected and the people rose to the occasion and came out in large numbers to help the affected. Food items, clothes, blankets and medicines were collected and supplied to the affected areas. The district collector of Trivandrum initiated and coordinated all these

efforts. Some of our fellow members were also affected by the floods. Some of them lost their homes and some others lost their clinics which was the main source of their livelihood. IDA state officials including the state President Dr Siju C Paulose, Secretary Dr Suresh and President elect Dr Abhilash GS visited the sites. According to their report many clinics were completely devastated and are beyond repair. They need huge amounts to restore their work place. Dear friends it is time for us to act. The IDA Kerala state has initiated a flood relief fund which is utilized only for helping our fellow members affected by the floods. IDA Attingal has already contributed a sum of rupees one lakh towards this and we are requesting our members to contribute more towards this. Dear friends I humbly request you all to donate generously and support our branch in this noble endeavor. Contributions can be done to the branch account or contact our treasurer Dr Arun S. Remember, this will be utilized exclusively to support our friends who are badly affected by the floods.

Dr. Pradeep C. Dathan
Editor, Impressions

Complete denture impressions – a simplified technique

* K. Chandrasekharan Nair, ** D. Bheemalingeswara Rao, *** S.U.MeghanaGajavalli,
*** G. Kranthi Kiran, **** A.V. Rama Raju, ***** M.C. Suresh Sajjan,

* Professor Emeritus, **Professor, ***PG Student, **** Professor and Vice Principal, *****Professor and Principal,
Department of Prosthodontics, Vishnu Dental College, Bhimavaram, A.P

Send correspondence: Dr. K. Chandrasekharan Nair, E-mail: chandrasekharannair.drk@gmail.com

Removable complete dentures are made to maintain oral health, function, aesthetics and psychological well-being. All attempts to treat the completely edentulous individual should provide adequate comfort during the entire period of treatment. To achieve these goals, denture foundation tissues should be recorded accurately using materials and techniques that will not violate the physiologic and tolerable limits of the oral tissues. The impression techniques used in complete denture prosthodontics can be grouped into mucostatic, mucocompressive, selective pressure, functional and neutral zone. Of these techniques, selective pressure has gained popularity because of the fairly good logic attached to it. A number of materials were used to make complete denture impressions like impression plaster, impression compound, zinc oxide eugenol impression paste, alginate and elastomers with a combination of stock as well as custom made trays¹. Elastomers are currently used because of its superior properties, ease of manipulation and patient acceptance. Hyde T P et al have conducted a randomised controlled trial of complete denture impression materials and concluded that: 1. Dentures made from silicone impressions were preferred by patients over dentures constructed from alginate impressions 2. Patients preferred the experience of having impressions taken in silicone, finding silicone impressions more comfortable. 3. Patients' oral health related quality of life was better after wearing dentures made from silicone impressions. 4. Unadjusted dentures made from silicone impressions were more comfortable, stable and efficient for chewing². Although impression materials differ in many aspects and a variety of techniques exist in making the impressions, there is no overwhelming evidence to conclude that the clinical long-term outcome of dentures fabricated using varying materials and methods would differ

significantly³. This is because of the multitude of variables related to patients, techniques and the operators⁴. The dawn of 21st century has witnessed clinicians accepting preliminary impressions made with alginate in a stock tray and subsequently a final impression made of silicone in a border moulded custom tray because of higher patient satisfaction⁵. Conventional impression methods followed in the last century do not appeal the present day dentist as well as the patient. Impression should be less time consuming without compromising the quality. Use of elastomers will serve both the purposes and hence a simplified impression technique for complete dentures is described here.

1. Preliminary impression of both the arches are taken with silicone putty in appropriate stock trays. The impression thus obtained is modified for border thickness and extensions by reduction or addition. The impression is then lined with poly vinyl siloxane light body. Casts are poured in dental plaster. (Fig 1 - 3)

2. The rugae region is covered with a layer of wax as relief. Undercuts present at tubercosity is blocked out with wax. Mandibular ridge crest which is less than 4mm in width is covered with wax. Lingual undercuts are blocked out with wax. Auto polymerizing acrylic trays are prepared over the casts. (Fig 4,5)

3. After curing, the trays are removed and the wax adhering to them is eliminated completely. The tray is lined with light body and inserted into the mouth. After removal of impression, the lining is removed from the borders. (Fig 6,7)

4. Border moulding is completed with poly vinyl siloxane putty. Vaseline is added to both the components of putty to improve the flow to suit border moulding. (Fig 8,9)

5. Light body lining from rugae and midpalatine



Fig 1. Maxillary preliminary impression



Fig 2. Mandibular preliminary impression



Fig 3. Preliminary casts

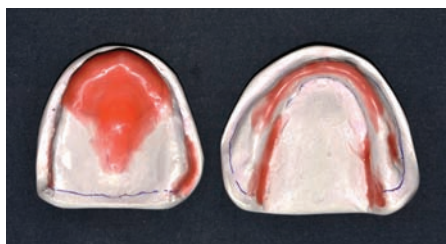


Fig 4. Wax relief and block out of undercut areas



Fig 5. Custom made trays



Fig 6. After removing the relief wax, the tray is lined with light body



Fig 7. Mandibular tray lined with light body



Fig 8. Border moulding is completed with PVS putty.



Fig 9. Mandibular border moulding is completed with PVS putty

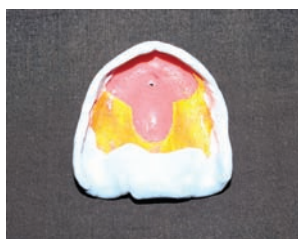


Fig 10. Light body lining is removed from rugae region and midpalatine raphe



Fig 11. Lining is removed from the anterior ridge



Fig 12. Completed maxillary impression



Fig 13. Completed mandibular impression

raphe is removed. In the mandibular tray, the lining is removed from the anterior region of the ridge. The exposed tray is coated with adhesive and the impression is completed with light body elastomer. (Fig 10-13)

This technique uses elastomers which are known for the superior properties. Patient acceptability of the clinical step is unequivocally good. It is less time consuming and hence clinicians will also accept it.

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Vascular lesions of oral & maxillofacial region: an update

* Elizabeth A. Antony, **Arjun J., ***Preeja Premkumar, ****Deepa M.S.

*Intern, **Final year student, ***Senior Lecturer, **** Professor & HOD, Department of Oral Medicine & Radiology, Azeezia College of Dental Science & Research, Meeyanoor PO, Kollam.

Send correspondence: Dr. Elizabeth A. Antony, E-mail: elizabethantony00@gmail.com

Abstract

Vascular anomalies constitute a diffuse group of conditions which can range in their significance from being completely harmless & of little clinical relevance to being potentially life threatening. Vascular lesions are localised structural defects of the vasculature. Their anomalies can occur throughout the whole body, with 60%, however being located in the head & neck region. Probably due to this intricate vascular anatomy of the region. It is important that dentists have a good understanding of these conditions so that the risk of potential complications of dental treatment in affected patients are reduced as much as possible. The article focuses on the pathogenesis, diagnosis & treatment of these conditions, with explanation on their relevance to the practising dentist.

KEYWORDS: Capillary malformation, Venous Malformation, Arteriovenous malformation, Lymphatic Malformation, Hemangioma.

Introduction

Vascular lesions are the most common congenital & neonatal abnormalities¹. Vascular lesions are derived from blood vessels and lymphatics with different clinical & histological features with varied treatment². More than 50% of malformations are benign lesions located in the head & neck³. Various etiology that causes vascular lesions are trauma, infections, hormonal alterations & progressive increase with age⁴. They usually occurs in children & young adults with prevalence in head & neck area. This is true for venous type⁵. In oral cavity the lips, tongue and cheek, mucosa and palate are mostly affected⁶, which leads to aesthetic changes, pain, ulceration and bleeding, impaired speech, dental asymmetry, and obstruction of upper airway⁷.

This article highlights the current classification, clinical features, diagnosis & treatment plan of various lesions in the head & neck region.

CLASSIFICATION⁸

The first classification of vascular lesions was developed by Virchow (1863) & his student Wegner

(1877). After this many different classifications were presented that use anatomical labels or descriptive terms without regard to the biological behaviours of the various vascular tumours present.

Classification of vascular lesions

International society for the study of vascular anomalies

| VASCULAR TUMOURS | VASICULAR MALFORMATIONS |
|-----------------------------------|-------------------------|
| LH | slow (low) flow |
| CH | CM |
| RICH | VM |
| NICH | LM |
| KHE | fast (high) flow |
| Angiofibroma | AVMs |
| Spindle cell hemangioendothelioma | AVFs |
| Tufted angioma | Arterial malformations |

| | |
|--|--|
| Pyogenic granuloma and other Complex/combined malformations dermatologic-acquired tumours (various combinations of above) | |
| Other rare hemangioendothelioma (epithelioid, composite, retiform, Polymorphous, Dabska-tumour, Lymphangioendotheliomatosis etc..) | |

RICH: Rapidly involuting congenital hemangioma;
 CM: Capillary malformation
 NICH: Non involuting congenital hemangioma;
 LM: Lymphatic malformation
 CH: Congenital hemangioma;
 AVM: Arterio Venous malformation
 KHE: Kaposiform hemangioendothelioma;
 VM: Venous malformation
 LH: Infantile hemangioma;
 AVF: Arterio Venous Fistula

Hemangioma

Hemangiomas are common benign proliferation of the blood vessels that develop mainly during childhood, There are mainly two forms of hemangioma; Cavernous & Capillary. The capillary hemangiomas occur as flat areas mainly made up of small capillaries whereas, cavernous hemangioma are seen as elevated lesion with a deep red colour with large dilated sinuses⁹.

Hemangiomas are divided into Infantile hemangioma (IH) & Congenital hemangioma (CH). IH is further classified on the site of its occurrence as focal, segmental & indeterminate. IH is not present at birth but appear during the first 8 weeks of life. Its a true benign neoplasm of the endothelial cells.

Congenital Hemangiomas are biologically different from IH.

IH is more common (70%) than CH (30%). They occur as fully developed lesions or rapidly involuting during 1st year of life.^{10,11}

• Management.

Multifactorial management, which depends on patient's age, size & extent of lesion & clinical characters. Mostly need no intervention. Some may regress, and those that does not cause aesthetic problem are left untreated. 10-20% need treatment. Severe haemorrhage is a complication in surgery, Flash lump pulsed laser, Intra lesional injection of

fibrosing agent, Interferon alpha-2b electrocoagulate with cryosurgery compression & radiation. Hemangiomas are having a female predominance, may ulcerate, painless, soft, smooth [X3], lobulated, senile, pedunculated, slow development, moderately firm on palpation, "Blanching effect" is noticed, compressible & filled up slowly again⁴.

Pyogenic granuloma

Pyogenic granulomas are common non neoplastic localized soft tissue growths. Oral pyogenic granuloma is a smooth or lobulated exophytic lesion, pedunculated or senile & is usually haemorrhagic¹⁴. It is a type of vascular & inflammatory cellular proliferation due to various stimuli like drug reactions, hormonal variations & graft reactions, chronic irritations caused by local dentures. It is a reactionary inflammatory process filled with proliferating vascular channels, immature fibroblast connective tissue & scattered inflammatory cells. Pyogenic granuloma are not confined to oral cavity but can be seen in head and neck region, trunk and extremities.

It can occur in all ages and more in 2nd & 3rd decades of life¹⁵. There is a male predilection. 2% of pregnant women develop in the first 5 months of pregnancy¹⁶, can occur anywhere in the oral cavity with gingival predilection, endothelial proliferation of unknown cause.

Vascular malformations

Vascular malformations arise from an error in morphogenesis in any combination of arterial, venous & lymphatic vascular networks. These vascular anomalies present at birth, grow proportionally to the size of the child & do not exhibit any tenderness to involute spontaneously. Trauma, puberty & pregnancy can also cause accelerated growth. The great majority of congenital vascular malformations are recognisable in childhood.

i. Capillary malformations.

(Previously called port wine stain, capillary hemangioma). Capillary malformations have an equal sex distribution. The birth prevalence is reported to be 0.3%. The cutaneous discolouration is often, but not always evident at birth. Focal CMs often occur in dermatomal distribution. 45% of facial port wine stains are restricted to one of the three trigeminal dermatomes, while 55% of facial CMs overlap sensory dermatomes, cross the midline or occur bilaterally.

The pathogenesis of the CMs is thought to be at least part of an abnormal neural regulation process. Early stains are usually flat & pink. As the child matures, vasculature dilates, the CM may evolve into a raised, thickened plaque. The CM becomes red to purple, lesions may become studded with vascular papules, imparting a cobblestone like appearance. The area of skin affected grows in proportion to general growth. This malformation is often associated with Sturge-Weber syndrome. This syndrome consist of a facial CM with eye disease (chordial vascular malformation, glaucoma, bupthalmus) & neurologic disease (leptomenigeal, venous malformations [VMs], seizures, hemiparesis etc....)

ii. Venous malformations.

Venous malformations are the common type of vascular malformations previously termed as cavernous hemangioma. They are composed of thin walled, dilated, sponge like channels of variable size and mural thickness with normal endothelial

lining and deficient smooth muscle. Venous anomalies are common in the skin & subcutaneous tissue of the skin & subcutaneous tissue of the head & neck region, particularly in the lips & cheek.

The pathogenesis of the malformation is due to mutation in angiopoietin receptor (TEK).

It is soft compressible, non pulsatile mass with rapid refilling. VMs can occasionally be completely intraosseous & the mandible is the most common bone involved. Although maxillary, nasal & frontal lesions have also been reported. It is thought that most lesions that are described as "intraosseous hemangioma" are infact VMs.

iii. Lymphatic malformations

Lymphatic malformations are rare, slow flow, congenital vascular malformations comprising malformed lymphatic channels that are forming cysts. The head and neck are the most common site of LMs. LMs usually enlarge slowly overtime, but abrupt enlargement may occur in cases of infection or internal hemorrhage .



Fig. 1 Arterio Venous Malformations of Face.



Fig. 2 Infantile Hemangioma.



Fig. 3 Pyogenic Granuloma.



Fig. 4 Capillary Malformation of face.



Fig. 5 Cavernous Hemangioma of Face.

The etiology of LM is not exactly known, but presumably involves the failure of embryonic lymphatic system to adequately separate from or to connect to the venous system. Often multiple translucent vesicles containing a viscous fluid are present at the level of the skin or mucosa, which resembles "frog spawn". The surrounding skin is normal, sometimes with a bluish hue. The surface lesions are connected to deeper cisternae for lymph fluid lying in the subcutaneous or submucosal tissue. Microcytic lesion is characterised by comparatively firm lesions with poorly defined edges & massive generalised edema. Mostly affecting floor of mouth, jugal mucosa & tongue. The complications include infection, bleeding, obstruction of the airway, disturbance of speech & abnormal facial growth.

iv. Arteriovenous malformations.

AVMs are localised, extensive high flow malformations. Oral lesions are more common on the gingiva, causing mobility of teeth & profuse periodontal bleeding. Lesions close to the surface may produce a palpable thrill or pulsation. They are firmer than VMs & do not empty readily when they are compressed.

• Investigations

Diagnosis of most vascular lesions are made by the use of accurate terminology of lesion, detailed clinical history (time of appearance, presence of precursor lesion, growth pattern & involution) & physical examination of the lesion.

Special investigations such as imaging modalities in the form of Color Doppler Ultrasound, Magnetic Resonance Imaging (MRI), Computerised Tomography (CT), Phlebography, Nuclear Imaging studies, Single Photon Emission CT, Multiplanar Computed Angiography help diagnosis & distinguish vascular lesions.

Dental importance

An indepth understanding of the natural history of vascular anomalies is critical for practitioners who diagnose & manage these lesions. There are frequently lack of understanding & apprehension among dental practitioners treating patients with vascular lesions of the oral & maxillofacial region. Arteriovenous malformations are rare lesions which can easily be misdiagnosed, yet produce the very dramatic clinical presentation of severe life threatening oral bleeding. A variety of other lesions can resemble hemangioma in the oral cavity. The

different diagnosis include pyogenic granuloma, chronic inflammatory gingival hyperplasia, epulis-granulomatosa, telangiectasia, angiosarcoma, squamous cell carcinoma and other vascular appearing lesions of face or oral cavity such as Sturge-Weber syndrome^{18,19}.

Treatment

There are various treatment modalities & guidelines for the management of hemangiomas & vascular malformations. Depending on the stage & type of lesions, each has its own varied treatment. Most hemangiomas do not require any treatment and only need close observation to ensure that complications do not arise. Corticosteroids are the first line of treatment for alarming or potentially endangering hemangiomas & may be administered systemically, intralesionally or topically^{20,21}.

Normal starting dose begin at 2-3 mg/kg/day of prednisolone followed by the tapering of dose gradually once the adequate response is obtained. If the lesion does not respond to corticosteroids, Vincristine or IFN- α -2b can be used as a second line of treatment. Laser therapies are also effective for treating superficial and deep hemangiomas.

The current management techniques of CM are cosmetic camouflage, laser therapy followed by excision and grafting & surgical resection or a combined approach sclerotherapy is used to reduce the size of lesion on preoperatively as a support to surgery.

Conclusion

It is important that dentists have a good understanding to these conditions so that the risk of potential complications of dental treatment in affected patients is reduced as much as possible.

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Tongue print: an undeniable proof in biometric authentication – A brief review

* Shali S. Nair, **T.T Sivakumar, ***Anna P. Joseph, ****Varun B. R, *****Vinod Mony

*Post Graduate Student, **Professor & HOD, *** Professor, ****Associate Professor, *****Reader, Department of Oral Pathology & Microbiology, PMS College of Dental Science and Research, Vattappara, Trivandrum.

Send correspondence: Dr. Shali S. Nair, E- mail: shalinair76@gmail.com

Abstract

Biometrics based authentication is emerging as the most reliable solution for establishing the identity of individuals in a variety of applications. Although many conventional systems are available for biometric identification each one has its own drawbacks. Tongue print collected from the dorsum of the tongue carries a great deal of information along with its visual difference in shape, texture and pattern. In this paper, we are discussing on the various aspects of tongue prints and its recognition as a biometric tool.

Key words: Tongue print, biometric, authentication, digital.

Introduction

Biometric system recognizes persons based on their physiological (e.g., finger print, iris) and / or behavioural (e.g., signature) characteristics or traits. This technology finds various applications for human authentication in areas including secure control access and forensics. The dorsum of the tongue carries a great deal of information along with its visual differences in shape, texture and pattern, which is referred to as the 'tongue print'. Current modes of biometric systems include finger print, palm print, iris scan, face recognition, voice recognition and signature verification. Tongue prints have been found to be unique for each individual and thereby can be a remarkable tool for biometric authentication.¹

Categorization of tongue prints

Classification of tongue features based on categorization of tongue parameters was put forth by Stefanescu et al in 2014. According to him tongue texture consists of physiological, scrotal and geographic with tongue shape as ovoid, ellipsoid, rectangular, pentagonal, trapezoid to asymmetrical. The longitudinal groove include perceptible/imperceptible, rectilinear/twisty, superficial/deep with sharp/septate lingual apex.^{2,3} Tongue prints can also be classified based on five visual param-

eters such as pattern, margin, shape, fissure, and texture.⁴ (Table 1)

Table 1

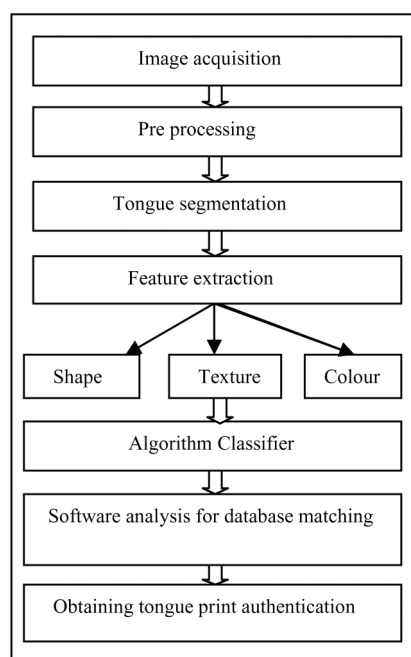
| Categorization of Tongue Parameters [PMSFT] | |
|---|--|
| Pattern | Reticular, Wavy, Linear, Horizontal |
| Margin | Smooth, Scalloped |
| Shape | U- Shape, V- Shape, Square |
| Fissure | Type- 1 (Continuous central fissure) Type- 2 (Noncontinuous central fissure) Type- 3 (Continuous central fissure with lateral fissures) Type- 4 (Noncontinuous central fissure with lateral fissures) Type- 5 (Lateral fissures only) Type- 6 (Absence of fissures) |
| Texture | Velvety, Pebbly, Matted |

Digital conversion of tongue print images

Computerised tongue image classification comprises of two important steps which are tongue image acquisition and tongue diagnostic software. The

software part consists of both image processing part and database system for archiving and managing acquired tongue images. The digital conversion of tongue print images requires the following steps:

Steps for digital conversion of tongue print images



1. Image acquisition

A good quality photographic image is the pre-requisite for the computation procedure. The individuals are asked to protrude the tongue outwards and downwards keeping it in the most relaxed position without extra effort. Images of dorsal tongue are captured under the standardized lighting conditions using a Hi-tech digital SLR camera with fixed head position and tongue protrusion while maintaining the distance of subject to camera.⁴ The environment are also taken into consideration and flash is provided if the lighting of the place is not enough for the colour accuracy of the tongue image.

2. Pre-processing

The original tongue images are subjected to image pre-processing before performing feature extraction. Tongue localisation and normalisation are the two important software procedures in pre-processing. This is done by image stretching and extraction of region of interest from original tongue images. ROI's (Region of interest) tongue blocks are selected on the central part of original tongue im-

ages manually. The size of whole ROI is preferred to have 128 x 128 pixels and the sub-block having 64 x 64 pixels. The image processing part has tongue boundary detection and tongue colour/shape/texture recognition algorithm.⁵

3. Tongue segmentation

Tongue segmentation is one of the most essential steps in automated tongue diagnosis. It is the method of cropping used to detect the boundary of tongue body. Previous works on tongue segmentation used regular gradient operator to detect the boundary of tongue body and then active contour model is utilized to crop the tongue area. More recently automated tongue segmentation has been done by combining polar edge detector, edge filtering, edge binarization and active contour model. The active contour model (dynamic contour model) is a mechanical visual approach to select the edge of an item. Active contour is a technique used for extracting salient features from an image.⁶

4. Feature extraction

Shape parameter is calculated by using control points which gives the prominent outlines of shape feature of tongue. Polar edge detection is used to extract tongue boundary and tongue edge detection algorithm for tongue area separation. Edge line interpolation is recommended for user interface system for archiving and managing acquired tongue images.⁷

Colour information is of great importance for the tongue inspection by computer-aided tongue diagnosis system. In the tongue image, the colours of the tongue body are classified as light pink, rose pink, red and purple. RGB colour histogram is used to analyze the different colours of tongue.⁷ However, the RGB signals generated by different imaging devices varies greatly due to the usage of different kinds of digital cameras and dissimilar lighting conditions.

Tongue print textures for personal authentication have been done using Wavelet approach and in this approach statistical measures are applied to the processed images to extract features. Texture of tongue features have also been extracted on basis of Steerable filters and Weber Law Descriptor. Steerable filters have been used to extract region of interest from the original tongue images, where as Weber Law Descriptor are used for local feature extraction.^{5, 8}

5. Algorithm Classifier

The statistics which used to describe the processed images for pattern recognition are fed to the k-NN classifier (k-nearest neighbour algorithm). It is a nonparametric method which assigns query data to the class that majority of its k-NN belong to and the performance of k-NN depends on the number of the nearest neighbour k. The statistics used to describe the processed image are the mean, standard deviation, smoothness, third moment, uniformity and entropy. The objective of k-NN classifier is to find the value of k that maximizes the classification accuracy and these classifiers have the ability to explain the classification results.⁸

6. Soft ware analysis for database matching

Matching feature points between images is one of the fundamental issues in computer vision tasks. The tongue images that form training and testing databases are randomly selected. Finally, the correction recognition is computed for each experiment. The Matlab software is used to perform wavelet analysis (extract texture features from tongue images) and to train and test the k-NN classifier. So the classifier have been trained and tested with k varying from one to five so that the best recognition rates can be obtained.⁸ To make tongue recognition more secure there is a need for tongue biometric template with three views left and right lateral view and profile view. This is done since tongue is a non-rigid organ and due to the difficulty for a person to keep it straight. Matching the tongue prints are applied by using algorithms and is done by calculating Euclidian distance that is between edge ridge end and all other ridge ends. It is also similarly done between all bifurcations to achieve high accuracy after taking the average for both input images.⁹

Conclusion

An ideal biometric system depends on parameters such as system reliability, cost effectiveness,

flexibility, and necessity of physical contact with the scanning device. Tongue recognition is predicted to support the facet of identification and non-repudiation of information. The human tongue presents both geometric outline and physiologic texture information which are potentially useful in identity verification applications.^{10, 11}

A biometric system is essentially a pattern recognition system which recognizes a user by determining the authenticity of a specific anatomical characteristic possessed by the user. The complexity of the tongue prints due to the combination of multiple recognizable parameters makes it an ideal tool for biometric authentication.

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Dental biomedical waste management

*Sharanya Suresh, *Sreelekshmy M., *Sumayya.P.K., **M.S. Deepa

*Intern, **Professor and HOD, Department of Oral Medicine and Radiology,
Azeezia College of Dental Science and Research, Kollam

Send correspondence: Dr. Sharanya Suresh; E-mail: sharanyasureshknr@gmail.com

Abstract

Dental waste can be hazardous to humans and the environment. Proper handling, treatment and disposal of biomedical waste are important elements of health care office. Properly designed and applied, waste management can be a relatively effective and an efficient compliance-related practice. Some wastes from health care facilities, however, are contaminated. If not disposed of properly, contaminated waste may carry micro organisms that can infect the people who come in contact with the waste as well as the community at large. Care is required when disposing of clinical waste, to protect and maintain the immediate environment from contamination, and to ensure the safety of those who come into contact with it. It is time that the curriculum for medical, paramedical and dental education give due importance to this vital tissue. This article provide information to dentist and dental staff that, they need to properly manage dental waste and render suggestions for managing the wastes from the day-to-day activities in dental practices, such as Amalgam waste, mercury, used cleaners for X-ray developer systems, X-ray fixers and developers; shields and aprons, lead foils; chemical sterilants solutions; cleaners, disinfectants and other chemicals; and general medical waste. Dental health care staff should be aware of the proper handling and the management of dental waste.

Keywords: Biomedical waste, Dental clinics, Waste management, Amalgam, Certified biomedical Waste Carrier (CWC)

Introduction

Inappropriate waste management practices leads to health problems to the public including professionals and environment. According to US medical waste tracking system, the dentist generate 3 % of total medical waste¹. Most of us knowingly or unknowingly becomes a part of it. Biomedical waste is generated during the diagnosis, treatment or immunization of human beings or animals or in research activities. This waste is potentially hazardous, the main hazard being infection, and may cause serious threat to human health, if management is indiscriminate and unscientific. Proper collection and segregation of biomedical waste are important.

Dental practices generate large amount of cotton, plastic, latex, glass, sharps, extracted teeth and chemical wastes such as lead foil, mercury from amalgam restorations, photographic chemicals like fixer and developer². Their improper disposal can lead to major hazards, environmental burden and infectious risk to the persons handling them.

The waste Act defines "hazardous waste" as that which contains organic or inorganic elements or compounds that may owing to their inherent physical, chemical or toxological characteristics have a detrimental impact on health and the environment." Health care waste" consists of both health care general waste (HCGW) and health care risk waste (HCRW). HCGW is that portion of waste that

poses a minimum degree of risk to human health and the environment, i.e. from administrative and housekeeping activities, for examples paper, pens, plastics etc. HCRW is that portion of the healthcare waste that is hazardous and which is capable of producing disease or injury and includes the following:

- a)infectious waste(including highly infectious material)
- b)anatomical waste (excluding teeth) or pathological waste ("laboratory waste")
- c)sharps waste
- d)pharmaceutical waste
- e)radioactive waste
- f)cytotoxic/ genotoxic waste
- g)sanitary waste

CLASSIFICATION³

There are nine classes of health care waste with atleast five that are likely to be generated in dental practices.

Class 2 - gases which includes flammable and non- flammable, non toxic varieties

Class 5 – oxidising substances and oxidising peroxides

Class 6 – toxic and infectious substances

Class 7 – radioactive materials that spontaneously emit ionising radiation

Class 8 – corrosive which comprise substances that by chemical action, cause damage to living tissues, to commonly used metals or to other packaging

The management of any health care waste starts

with correct identification of the waste, followed by classification, segregation and collection.

Management of biomedical waste in dental clinics

Biomedical waste are any solid, fluid or liquid waste, including its container and any intermediate product, which is generated during the diagnosis, treatment or immunization of human beings or animals, in research pertaining thereto, or in the production or testing of biological and animal waste from slaughter houses or any other like establishments(biomedical waste rules 1998 of India).⁴

Regulated hazardous waste includes products that are flammable, corrosive, toxic or reactive, pose some other risk to health or the environment. Hazardous material may enter the environment as a byproduct of dental procedures, such as when amalgam restorations are removed at high-speed suction lines carry the material to the waste water stream.

Some common materials or equipment that may be regulated in various locations include x-ray processing chemicals, acid etch disinfectants, monomers, some adhesives, x-ray film, lead foil and universal waste (eg. Batteries, fluorescent light tubes, computers and computer monitors, mercury containing thermometers.

Amalgam is probably the most well-known example of hazardous waste in the dental office. Because amalgam contains mercury, it is a regulated hazardous waste.

Color coding as per 2016 Rule (Published in the Gazette of India, Extraordinary, Part II , Section 3, Subsection(i), Ministry of Environment, Forest, and Climate change)

| Category | Type of waste | Type of bag or container to be used | Treatment and disposal options |
|---------------------|--|--|---|
| Yellow | Anatomical waste, soiled waste, expired or discarded medicines, chemical waste | Yellow coloured non-chlorinated plastic bags or containers | Incineration or plasma pyrolysis or deep burial |
| Red | Contaminated waste(recyclable) | Red coloured non-chlorinated plastic bags or containers | Autoclaving or microwaving |
| White (translucent) | Waste sharps including metals | Puncture proof , leak proof , tamper proof containers | Autoclaving or dry heat sterilisation followed by shredding or mutilation |
| Blue | Glassware , metallic body implants | Cardboard boxes with blue colour marking | Disinfection or autoclaving |

In offices where amalgam restorations are removed, the fine particles that enter the waste stream through the high-speed evacuator are often too small to be captured in the dental unit trap.

Mercury containing waste

Mercury used in restorative materials, during its placement and removal exposes the dental clinic atmosphere to vapours and aerosols which is hazardous to dental professionals, staffs and patients. Vaporous mercury waste management includes:-

- Store unused elemental mercury in a sealed container
- Contact to a Certified biomedical Waste Carrier (CWC) for disposal and recycling
- Use a “mercury spill kit”
- Unused elemental mercury reacts with silver alloy to form scrap amalgam
- Not placing elemental mercury in the garbage
- Do not wash elemental mercury in the drain

Scrap amalgam waste management implicates:-

- For the management of scrap amalgam: Mercontainer TM (sponge type) is appropriate to store the scrap amalgam.
- Using suction traps and disposable amal-

gam separators on dental suction units, to prevent amalgam accumulation trap should be changed weekly.







- Required amalgam amount only mixed or use premeasured amalgam capsules.
- Do not throw extracted teeth filled with amalgam in the regular garbage
- Use mercury containers to store all scrap or old amalgam^{5,6}
- various restorative material not containing mercury can be promoted in private practice.

Radiographic waste

Radiographic waste mainly include silver in fixer solution and lead in x-ray films. Silver a heavy metal which act as an enzyme inhibitor by interfering with the metabolic process of organisms. The lead foil inside x-ray packet and lead aprons contain leachable toxin which can contaminate soil and ground water in landfill sites after disposal.

- After desilvering the fixer with a recovery unit, it can be mixed with developer and water and disposed down the sewer or septic system. The silver and lead should be handled over to CWC. As a precautionary measure newer radiographic devices like RVG should be used.

BIO - MEDICAL WASTE

| | | |
|--|--|---|
| <p>CYTOTOXIC WASTE સાઇટોટોક્સિક કચરો</p> <p>Black Bag</p>  <ul style="list-style-type: none"> • Cytotoxic Waste • Expiry Date Medicine • Radio Active Substance Waste <ul style="list-style-type: none"> • સાઈટોટોક્સિક વેસ્ટ • ઓક્સિજન ડેઈલી દવાઓ • રેડિયો એક્ટિવ વેસ્ટ | <p>INFECTIOUS WASTE (PLASTIC) રોગી ખાસતી કચરો</p> <p>Red Bag</p>  <p>Used and Disposable plastic items like...</p> <ul style="list-style-type: none"> • Blood Bags • Infectious I. V. Sets • Infectious plastic tubings • Rubber catheters • Cut plastic / latex gloves <p>વપરાશ બાદ નિકાલ કરવા શોગ્ય વસ્તુઓ જેવીકે.....</p> <ul style="list-style-type: none"> • બ્લડ બેગ • શેપ્યુલ્સ સ્થાપ, વી. સેટ્સ • શેપ્યુલ્સ ખાસતીકની નળીઓ • રબરનાં ડ્રેપેટર્સ • ખાસતીક/ લેટેક્સ ગ્લોવ્સ કાપીને નિકાલ કરવા માટે | <p>INFECTIOUS SHARP WASTE રોગી તીક્ષ્ણ કચરો</p> <p>Blue Bag</p>  <ul style="list-style-type: none"> • Glass Bottles • Glass Ampoules • Injection Vials <ul style="list-style-type: none"> • કાચની બાટલીઓ • કાચની એમ્પ્યુલ્સ • ઇન્જેક્શન વાયલ્સ |
| <p>RECYCLABLE WASTE પરિવર્તનશીલ કચરો</p> <p>Green Bag</p>  <ul style="list-style-type: none"> • Office Stationery • Disposable paper cups • Tissue paper used for Domestic purpose • Kitchen Waste <ul style="list-style-type: none"> • ઓફિસમાં વપરાતી સ્ટેશનરી • નિકાલ કરવા શોગ્ય પેપર કપ • સામાન્ય વપરાશમાં લેવાયેલ ટીશ્યુ પેપર • ખોરાકી કચરો | <p>INFECTIOUS WASTE (NON PLASTIC) ખાસતીક સિવાયનો રોગી કચરો</p> <p>Yellow Bag</p>  <ul style="list-style-type: none"> • Infectious dressing material like gauze, cotton etc • Human organs, body parts and tissues • Blood bags • Discarded cytotoxic medicines • Discarded / expired drugs • personal protective Equipments - disposable gown, mask, cap • Infectious dressing material like gauze, cotton etc. <ul style="list-style-type: none"> • ચામચ નહીં કાંચ, પેશીઓ • રૂપાંતર • નિવાસ કોર્મ / સ્થાન મર્યાદા પિંડી નીચે કચરાઓ • જા રક્તમાં સ્થાનમાં નેપર્ડ નિકાલ કરવા શોગ્ય નાઈલ, માસ્ક, કપ • રોગી દુશ્મન નહીંતો દુ, ખાસતીક બેગ | <p>INFECTIOUS & INJURIOUS SHARP WASTE રોગી અને હાનિ પહોંચાડી શકે તેવો તીક્ષ્ણ કચરો</p> <p>Puncture Proof Can</p>  <ul style="list-style-type: none"> • Used Needles • Used Scalpel blades • Blades • Cannula Stylet • Lancets • Broken glass slides & cover slip <ul style="list-style-type: none"> • વપરાયેલ નેડલ • વપરાયેલ સ્કેલપેલ બ્લેડ • બ્લેડ • કેન્યુલાનું સ્ટાઈલેટ • લેન્સેટ • તુટેલી કાચની સ્લાઈડ અને કવર સ્લિપ |

Infectious waste

It mainly includes blood soaked or dripping gauze, cotton rolls, other items contaminated with blood, body fluids like dressings, plaster casts and bags containing residual or discarded blood and blood components. These hazardous waste should be segregated and enclosed in a yellow biomedical waste bag covered with a double bag labelled with biohazard symbol and refrigerated, if onsite for more than four days. Once accumulated, a CWC should be contacted for disposal.

Sharps

It includes needles, scalpels, glass carpules, burs, acid etch tips, files, scaling tips, blades and other sharp objects. Their disposal includes collection in a red or yellow puncture resistant container with a lid that cannot be removed. The container should be properly labelled with biohazard symbol and once full, CWC should be contacted for disposal.

Chemical and pharmaceutical waste

Many of the chemicals are toxic, genotoxic, corrosive, flammable, reactive, explosive or shock sensitive and some may cause intoxication, injuries including burns.

Staffs handling these materials should be trained in Work place Hazardous Materials Information System (WHMIS). Whenever possible, use steam or dry heat to sterilise dental instrument. Non-chlorinated plastic container (not PVC) should be preferred to minimize environmental impacts and placed in the solid waste stream. Halogenated sterilants have a detrimental effect on environment. Ignitable sterilant should not be poured down the drain as they have potency to explode. Formaldehyde sterilant also should not be disposed down a drain. One should not pour sterilant into a septic system as this may significantly disrupt the bacteria, which normally breakdown wastes.⁷

Non hazardous waste

Paper, cardboard, aluminium, plastic are non hazardous waste, whose use should be minimized in dental clinic. Container or packaging made of PVC plastic should be avoided where feasible, as this is difficult to recycle and produce acid gases, if incinerated. Paper waste, cardboard and plastic containers (clean or rinsed) should be recycled where the service exists.

Waste materials are routinely generated during the provision of oral healthcare. Most of this waste

is non-hazardous and can be managed in the same way as household waste. However some products used in dental practices can pose a risk to humans or the environment if discarded into landfills or poured down drains. The US Occupational Safety and Health Administration (OSHA) defines regulated medical waste in the Bloodborne Pathogens Standard. Regulated medical waste is liquid or semi-liquid blood or other potentially infectious materials (OPIMs), or items that would release the same if compressed. All the other waste such as gloves, patient bibs, and disposable gauze that does not release blood is not regulated but should be disposed and discarded in a manner that will not lead to accidental barehanded contact by office or cleaning person.

Proper storage and labelling of regulated medical waste is one of the many provisions of the Bloodborne Pathogens Rule. Some dental practices may perform procedures that result in waste products that are contaminated with blood or OPIM. If this items will release fluid blood or OPIM during handling (or dried blood that would flake), they must be discarded as regulated medical waste.

Waste avoidance

Completely avoiding generation of any waste should be the first preference for dentist and their staff and all possible measures should be taken to achieve this. Where avoidance is not possible, minimise the amount of waste generated by source, by reducing the amount of packaging material when goods are initially delivered to the practice or by re-using and recycling.

Avoidance can also be achieved through measures such as:

- Appropriate staff training programmes
- Careful selection of supplies that are less wasteful or less hazardous,
- Use of physical rather than chemical cleaning methods,
- Monitoring the quantities of both hazardous and general waste sent for treatment and disposal
- Minimise production as much as possible,
- Sterilisation of re-usable dental and other equipment using approved sterilisation procedures

Waste segregation and containerisation

Good segregation of waste is the key to effective management of healthcare waste as this separates hazardous from the non-hazardous components and ensures appropriate containerisation and handling throughout the cradle-to-grave process. Effective

segregation will also minimise the amount of waste that will require expensive treatment processes, thus reducing costs. Dentist must ensure segregation takes place at or as near as possible to the source at which the waste is generated and that there are appropriated and clearly labelled containers available for staff to use. Proper containerisation is crucial factor for the safe and effective management of HCRW and requires the most environment friendly and simple receptacles of suitable sizes, designed to minimise risk of spillage, leakage or needle prick injuries. Training of staffs to associate colour coding with appropriate categories of HCRW is essential.

Packaging for healthcare general waste

- Solid healthcare general waste must be placed into colour-coded packaging. The standards recommend that extracted teeth be placed in red colour coded packaging for disposal.
- Plastic bags used for the collection of HCGW must be strong enough so as not to tear easily during handling and transportation.
- Containers for healthcare general waste must not be filled to more than three quarters capacity and must be securely closed to prevent spillage.

Packaging for infectious healthcare risk waste

- Infectious HCRW must be placed in colour-coded packaging.
- A plastic bag used for this purpose and used as a standalone intermediate container shall have a thickness of not less than 80 micrometer. It must be placed into a rigid container for transportation purposes.
- Any packaging used for anatomical and infectious waste shall be leak proof.
- Plastic bags must be closed with non-PVC plastic ties, non-PVC plastic sealing tags of the self-locking type, or heat sealers purpose-made for healthcare waste and not with staples.
- All plastic bags and containers shall be clearly marked and labelled with the infectious hazard label, where possible. If a plastic is placed into another container shall be clearly labelled.

Packaging for sharps

- All sharps containers shall be colour-coded.
- A sharps container is to be used for the collection of all sharps, regardless of whether the sharps are contaminated or not.
- Associated contaminated material eg; syringes, tubing, containers, preparation materials,

vials and ampoules, etc may be placed in the sharps container.

Packaging for pharmaceutical waste

- Liquid pharmaceutical waste must be collected in metal or high density plastic containers that are sealed with a screw cap lid or tamperproof lid.
- Solid pharmaceutical waste should be collected in double layer green colour-coded plastic bags.

Packaging for chemical waste and heavy metal waste

- The dark green packaging for chemical and heavy metal waste should be labelled with lettering which is clearly visible and legible as "Chemical Waste"
- Any amalgam scrap discarded into general waste may lead to soil and/or water contamination with mercury.
- Scrap amalgam in any form is not to be put into red biohazard bags or trash bags and must not be rinsed down the drain, nor removed with high speed suction unless there are traps and filters properly installed in the dental chair vacuum systems
- Amalgam waste, when kept separate from other waste, can be safely recycled. The mercury can be recovered from amalgam waste through a distillation process and re-used in new products

X-Rays

- Used x-ray fixer is considered a hazardous waste because of its high silver content.
- X-ray developer that is accidentally mixed with used x-ray fixer must be handled as a hazardous waste.

Lead foil or Lead shields

- Lead foils, shields, and aprons are considered hazardous waste unless they are recycled for scrap metal content, in which case disposal must be by a licensed waste management company.

Interim storage of waste in a healthcare facility

The interim storage area shall be clearly marked and shall have:

- A hard-standing floor;
- Be easy to clean, be well lit and have good ventilation;
- Be secured to prevent unauthorized entry, for eg, by children, or unauthorized personnel, animals and birds;
- Be equipped with a fire extinguisher to deal with fire; and

- Where possible, a spill kit for spillages.

On-site collection and transport of waste

- Establish a routine for waste collection.
- During the transport of health care waste, the risk of exposing uninformed persons to the health care waste is considerably increased. It is essential that this process be carefully controlled manual lifting and carrying of heavy containers should be avoided.

- The contracted waste disposal company must ensure that the health care waste is transported in an appropriate vehicle and that the methods of transport are monitored.

Treatment and final disposal

The treatment and final disposal will not be discussed here as this does not take place on the dental premises. However, the dentist does have the responsibility to receive confirmation from the Waste Disposal Contractor that appropriate disposal is ensured.

Conclusion

Most dental practices are likely to generate at least one type of regulated waste, whether it is contaminated sharps, chemical waste or blood and tissue. It is important to understand that regulations regarding the handling, storage, and disposal of waste can vary a great deal from state to state. The local regulatory agency will be the best source of information regarding specific requirements in a given location. Written standard operating proce-

dures based on local regulatory requirements will help everyone ensure and maintain compliance. It is also useful to have clearly defined responsibilities regarding who in the office is responsible for regulated waste management. Biomedical waste management programme cannot successfully be implemented without the devotion, self motivation, willingness, corporation and participation of all sections of employees of any health care establishment. The management of health care waste involves active participation and coordination between governmental and non-governmental bodies, the bureaucracy and the health care personnel.

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Oral Squamous Cell Carcinoma With A Different Presentation

*Tanuja S., **Tatu Joy E., *** Shashi Kiran M., ****Rahul R.

*Post graduate student, **Professor and Head, ***Associate Professor, Department of Oral Medicine and Radiology, Sree Mookambika Institute of Dental Sciences, Kulasekharam, Kanyakumari dist, Tamil Nadu - 629 161

Send correspondence: Dr. Tanuja S., E-mail: tanu12.ganesh@gmail.com

Abstract

Oral squamous cell carcinoma (OSCC) is a significant public health problem worldwide. More than 95% of the carcinomas of the oral cavity are of squamous cell type, in nature. The development of OSCC is a multistep process requiring the accumulation of multiple genetic alterations, influenced by environmental influences, including tobacco products, alcohol consumption, viral infection, chronic inflammation and based with the patient's genetic predisposition. Here we present a case of oral squamous cell carcinoma of buccal mucosa with an extra oral ulcer in a 78-year-old female patient.

Introduction

Squamous cell carcinoma accounts for more than 90% of oral malignancies.¹ It represents the eleventh most common cancer in males and the sixteenth most common cancer in females.² Around 27,000 new cases of oral cancer are diagnosed annually, and approximately 5500 individuals die of this disease each year.³ Interestingly over the past decades a significant increase in the incidence of oral tongue cancer has been noted among young individuals. And such cases often are not associated with the traditional risk factors of tobacco and alcohol use, and the oral tongue, unlike the base of the tongue is an infrequent site for HPV-positive carcinomas. The cause of oral squamous cell carcinoma is multifactorial. Extrinsic factors include tobacco smoke, alcohol, and (for vermilion cancers only) sunlight. Intrinsic factors include systemic or generalized states, such as malnutrition or iron deficiency anemia. Heredity does not appear to play a major causative role, although few heritable conditions like fanconi anemia, dyskeratosis congenita have been associated with an increased risk for oral squamous cell carcinoma.

Case report

A 78 yrs old female reported to oral medicine and radiology department with a chief complaint of growth in right buccal mucosa and pus discharge in the right cheek region for past 6 months. And h/o pain was elicited for the past 2 months. Pain was continuous and throbbing type. Pain aggravates during intake of food, hot and cold substance and was not relieved by rest. No h/o radiating type of pain was present. Pus discharge was present extra orally just beneath right malar region. Pt has h/o of betel nut and tobacco chewing habit for past 8 yrs. Patient consumes betel nut 5-6 times per day and occasionally a tobacco leaf once a day.

On general examination patient was febrile, vital signs appeared to be normal, signs of anemia was present. Palpable and tender right and left submandibular and deep cervical lymphnodes were present with soft to firm in consistency. Multiple in number on either sides and roughly 2x2cm in diameter, with no fixity to underlying structures.

On extra oral examination facial asymmetry, with restricted mouth opening was seen. H/o extra oral ulcer occurrence 5 months after the initial oc-

currence of intra oral growth .On inspection an extra oral ulcer of size 2x3 cm was seen in the right cheek region, 2cm beneath the malar region, 2cm above the lower border of the mandible and laterally 2cm away from the vermilion borders of the lips which was irregular in shape with rolled out margins , and pus discharge was present. On palpation the lesion was tender and inspectory findings with respect to site, size, shape, and extent were confirmed.

On intra oral examination patient was completely edentulous. On inspection a large exophytic ulceroproliferative growth of size 6x5 cm which was found over the right buccal mucosa extending posteriorly from 38 region, 1cm from the pterygomandibular raphae, anteriorly extending to the lip commissures, superiorly extending to the upper second molar, inferiorly to the lower buccal vestibule, and growth is surrounded by a zone of hyperkeratosed area, which

was irregular in shape, diffuse, and indurated. On palpation the lesion was tender and inspectory finding with respect to site, size, shape, and extent were confirmed.

The positive findings of old age, female patient, ulceroproliferative lesion on buccal mucosa since six months were considered a provisional diagnosis of carcinoma of buccal mucosa. Differential diagnosis of squamous cell carcinoma, basal cell carcinoma, cancrum oris was considered.

Investigations

Orthopantomograph was taken. No evident bony erosions were seen.

An incisional biopsy was done. Histopathology of given section showed hyperkeratinized stratified squamous epithelium with underlying inflamed connective tissue stroma. The epithelium shows severe dysplastic features with abnormal level of



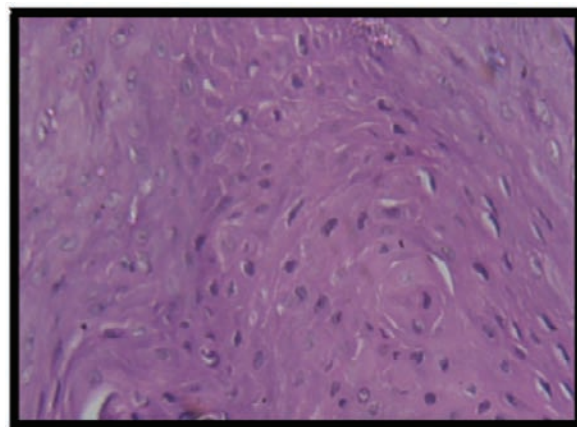
An extra oral ulcer was seen on the nasiolabial fold region



A single exophytic proliferative growth was seen on right buccal mucosa



Panoramic radiograph of the right side showing no bone loss and erosions.



Photomicrograph showing tumour islands with keratin pearl formation

mitosis, cellular and nuclear pleomorphism, individual cell keratinization, attempted keratin pearl formation. Once shows infiltration of neoplastic epithelial cells in to the connective tissue. Connective tissue stroma is moderately collagenous with plump fibroblasts. Diffuse dense chronic inflammatory cell infiltrate is seen consisting predominantly of lymphocytes, plasma cells, macrophages and few mast cells. Vascularity is high with engorged blood vessels and deeper areas shows adipose cells and muscle fibres.

Discussion

This is an unusual case of oral SCC in a 72-year-old female patient with involvement of extra oral tissues. OSCC – a disease found particularly in low income communities and mainly a problem of older men. More than 90% of all oral cancers are squamous cell carcinoma (SCC)⁴.

Lifestyle factors, especially tobacco and alcohol, appear particularly important but, in some cases, betel quid, sunlight exposure, ionising radiation, human papillomavirus (HPV), genetic or other infections or immuno-incompetence are relevant. OSCC can arise from a previously existing potentially malignant disorder such as oral leukoplakia, erythroplakia, submucous fibrosis and lichenoid dysplastic lesions.⁵

The most common site for intraoral carcinoma is the lateral border, posterior and ventral surfaces of the tongue followed by floor of the mouth. Less common sites are the gingiva, buccal mucosa, labial mucosa and hard palate.⁶

The lateral tongue and floor of mouth combine to form a horseshoe shaped of high risk region. There are two main reasons for the high risk region: first, carcinogens mix with saliva, pool in the bottom of the mouth and; secondly, less protection against carcinogens as these regions of oral cavity are covered by a thin, nonkeratinized mucosa.⁷

According to Pindborg, OSCCs are classified into histopathologic grades as well differentiated (grade 1), moderately differentiated (grade 2) and poorly

differentiated (grade 3). Well and moderately differentiated tumors can be grouped together as low grade and poorly differentiated and undifferentiated tumors as high grade.⁸ In this patient, it was a case of well-differentiated squamous cell carcinoma.

The treatment of OSCC generally requires the services of a multidisciplinary team, the main aim of treatment is to eradicate the cancer, to prevent recurrence and finally restore the form and function of the affected parts. Surgery is the preferred first line treatment of small, accessible OSCCs. However, advanced-stage OSCC is usually treated by a combined treatment program of surgery, chemotherapy, and radiotherapy.⁹ In this presenting case the patient was not willing for any further treatment procedures and needed only symptomatic relief. However she was referred to a nearby cancer care and eventually lost to follow up.

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Reconstruction of a fractured tooth using retrofitting of the intact crown

***Kurien Varghese, ** Sony Sebastian, **Bilaal Sidhique Abubacker, **Jiji M Edakkalathur**

*Professor & HOD, ** P.G. Student, Azeezia College of Dental Science and Research, Meeyannor, Kollam

Send correspondence: Dr. Kurien Varghese, E-mail: sony5445@gmail.com

Abstract

The fracture of tooth structure and/or restorative material within a crown or fixed partial denture abutment poses a restorative challenge. Depending upon the severity of the fracture and health of the tooth or teeth involved, the restoration often can be re-cemented, restoring the tooth to a serviceable condition. This case report describes a technique that provides a safe and efficient means of restoring the fractured tooth by retrofitting the intact crown.

Case report

A 44-year-old female patient reported to the department of prosthodontics for management of fractured maxillary anterior teeth.

On examination, a Full-ceramic crown (PFM) overlying the maxillary right lateral incisor was seen fractured at the cervical level (Fig 1). The underlying tooth structure presented with an oblique fracture at the cervical third of the crown. The prosthesis was an intact crown which had been bonded in place six months back (Fig 2), following endodontic therapy and restoration with the Porcelain fused to metal crown.

On radiographic examination the patient was given the option of: (a) retrograde post-supported core build up and recementing the same prosthesis, (b) orthodontic extrusion and fabrication of a new prosthesis, (c) extraction and implant-supported

prosthesis, and (d) extraction and a tooth-supported fixed partial denture

After discussing, the patient chose to have the same prosthesis recemented, due to the costs involved in the fabrication of a new prosthesis and duration of other treatment plans

First the remaining post endodontic filling was removed and the post-space was created (Fig 3). Then glass fiber post was cemented using dual-cure resin cement (Para core- Coltene) (Fig 4). The fractured tooth was removed from the crown using high speed airtor handpiece. The post length was adjusted coronally till the crown seated completely.

Then petroleum jelly was coated in the intaglio surface of the crown. Then dual cure resin cement was applied over the post coronally, and the crown was placed over the cement to shape the core (Fig 6). Then light cured the crown to make the setting faster. Then the crown was removed and core was

finished by removing the excess material. Crown was repositioned to check the marginal fit.

Petroleum jelly was wiped off from the intaglio surface of the crown and the surface was sandblasted. Then crown was luted with the dual cure resin cement and light cured (Fig 7). Patient was advised to attend for regular follow up visits.

Discussion

The technique elucidated resulted in a precise retrofitted fiber post-supported composite resin foundation which adapted well to the pre-existing crown. The complete protocol described here is time saving, affordable, and was preferred by the patient over the other treatment options proposed. Patient's



Fig 1 Fractured Maxillary right lateral incisor



Fig 2 Maxillary lateral incisor intact Crown



Fig 3 Post endodontic filling removed and creating the post-space



Fig 4 Cementation of glass fibre post using paracore



Fig 5 Removing the fractured tooth fragment from the crown using airoter handpiece

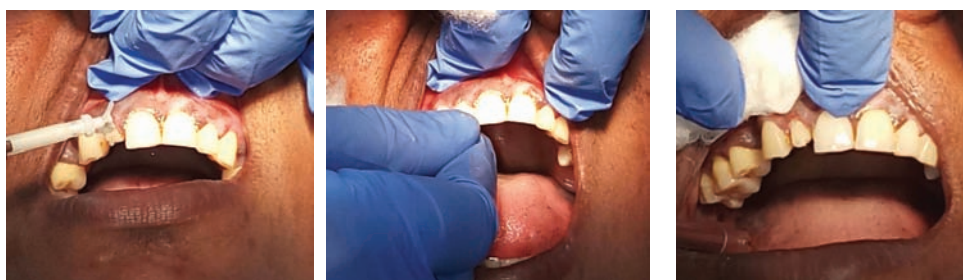


Fig 6 Core Build up using existing crown



Fig 7 Crown after cementation

motivation to maintain oral hygiene, complicated adhesive reattachment due to subgingival fracture, difficulty in achieving perfect adaptation between the fractured fragment and the tooth, lack of translucency, and unpredictable long-term durability of adhesive bond between attached surfaces are some of the limiting factors.

Conclusion

Retrofitting of crown is a simple technique to perform, and the additional time and cost of preparing new crown can be avoided. This technique depends on the extend and severity of fracture. Even though this technique looks simple, its technique sensitive.

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Abrikossoff's tumour-an uncommon benign neoplasm of tongue: a case report

*Sooraj S., **Sarin A. Nizar, , ***Neil Regunath, ****Rammohan R.S., ***Satheesh George

*Professor and HOD, **Senior Lecturer, ***Professor, **** Reader, ***Professor, Department of Oral and Maxillofacial Surgery, Sri Sankara Dental College, Akathumuri, Varkala

Send correspondence: Dr.Sarin A Nizar, E-mail: sarinnizar@yahoo.co.in

Abstract

Granular cell tumor (GCT) first described in 1926 by Abrikossoff who named it "myoblastenmyome" is a benign lesion characterized by the accumulation of plump cells with abundant granular cytoplasm. GCT is an uncommon asymptomatic sessile nodule with typical pink overlying mucosa. For its idiopathic and controversial histogenesis, over claims of its muscular, histiocytic, fibroblastic or neural origin, it was advocated to use the noncommittal designation of GCT. This type of tumor has been found to be both benign and malignant although malignancy is rare and comprises only 2% of all granular cell tumors.

Here we report a case of granular cell tumour of the tongue, in a 33-year-old male patient, which occurred on the postero-lateral border of the tongue and clinically mimicking a lipoma lesion.

Keywords: Abrikossoff's tumor; Granular cell tumor; Myoblastoma

Introduction

Alexei Ivanovich Abrikossoff, in 1926, first introduced the granular cell tumor (GCT), eponymically designating it as a Abrikossoff's myoblastoma. Granular cell tumor is an uncommon asymptomatic sessile nodule with typical pink overlying mucosa. GCT is a benign lesion characterized by the accumulation of plump cells with abundant granular cytoplasm. Various theories on the origin of GCT has subsequently been proposed.¹ A wide variety of cells, like histiocytes, fibroblasts, myoblasts, neural sheath cells, neuroendocrine cells, and undifferentiated mesenchymal cells types have been proposed as the cells of origin.²

Eguia et al. reported eight cases of granular cell tumours of the oral cavity with a 62.5% female involvement compared to 37.5% male involvement, and 75% occurrence on the tongue, one in lower gingiva and one in buccal mucosa.³ Sposto et al. also reported three cases of granular cell tumour of the tongue all of which involved female patients with age range between 30 years and 42 years.⁴ GCTs are typically small, solitary lesions; rarely do they exceed 3 cm in size. Both benign and malignant

lesions have been reported; although malignancy occurring is rare, comprising of 2% of all GCT's.⁵

Granular cell tumors can affect any organ or region of the body. However, in head and neck region it predominates by 45% to 65%. Of the head and neck cases, 70% of lesions are located intraorally (tongue, oral mucosa, hard palate) Among intraoral sites, anterior tongue is reported to be most affected, and specifically, 48% occur in the dorsum of tongue, 15% on the lateral border and rest on the ventral surface.⁶ The differential diagnosis of GCT of the tongue includes numerous benign mesenchymal tumors such as neurofibroma, ossifying fibromyxoid tumor, lipoma, chondroma, fibroma, neuroma, and schwannoma⁶⁻⁷.

Here we report a case of granular cell tumour of the tongue, in a 33-year-old male patient, which occurred on the postero-lateral border of the tongue and clinically mimicked a lipoma lesion.

Case Report

A 33-year-old male patient reported to our Department of Oral and maxillofacial surgery with a chief complaint of painless swelling on the right postero-lateral border of tongue since 1 year. The

swelling was initially small in size and slowly progressed to present size of 1×0.5 cm. The patient gave history of occasional trauma to the region after the size has increased and no history of pain, bleeding, ulceration or pus discharge. Past dental history, family history and drug history was not contributory. Patient gave no history of tobacco chewing and smoking.

Intraoral examination revealed a well circumscribed soft tissue swelling with a smooth surface, oval shape and measuring 1×0.5 cm approximately on the right postero-lateral aspect of tongue. The swelling was yellowish pale white in color with overlying mucosa. Characteristic loss of the gusta-

tory papillae of the overlying mucosa was seen. [Fig:1 and 2]

On palpation, swelling was firm, mildly tender, adherent to the underlying structures with no regional lymphadenopathy. A clinical diagnosis of lipoma was made. Routine hematological investigations revealed normal values. Excisional biopsy with clear margins was performed and specimen was sent for histopathological examination.

Histopathological examination of H and E stained section revealed lesional tissue consisting of parakeratinized stratified squamous epithelium showing pseudoepitheliomatous hyperplasia and an ill circumscribed neoplasm composed of cells



Figure 1 & 2: Well circumscribed nodular lesion located on the postero-lateral border of the tongue, measuring about 1 cm across its major diameter.

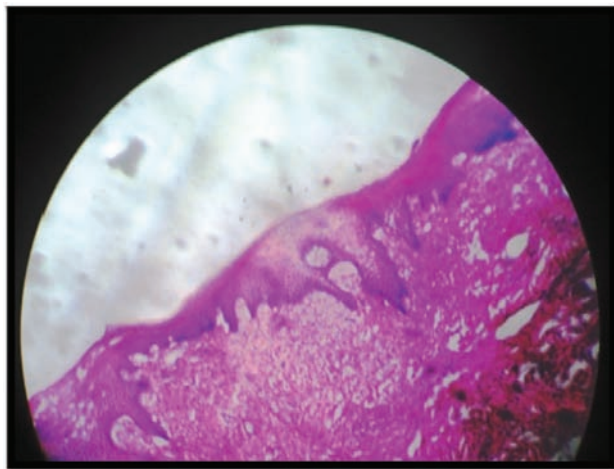


Figure 3: Panoramic view of the lesion exhibiting pseudoepitheliomatous hyperplasia.

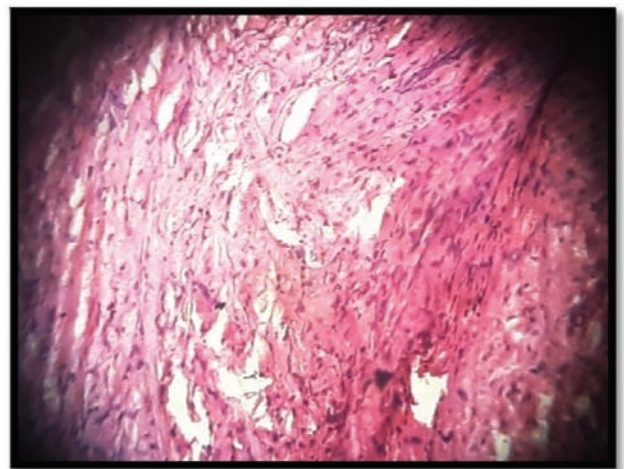


Figure 3: Photomicrograph of the granular cell tumor showing groups of cells with abundant granular cytoplasm.

arranged in nests and sheets among the deep skeletal muscle [Fig. 3]. Individual neoplastic cells are polygonal/fusiform with abundant coarse granular eosinophilic cytoplasm, bland round nucleus with indistinct cell borders. These neoplastic cells exhibit mild hyperchromatism and pleomorphism. Seromucinous glands seen in the resected margin. [Fig. 4]

Discussion

Abrikosoff tumour is an uncommon tumor that can affect various regions of the body, such as the skin, soft tissues, breast, and lungs. GCT is a slow growing tumour and usually asymptomatic and often discovered accidentally^{4,5}. It usually presents as a small single submucosal nodular mass, about 1–3 cm in size, hard in consistency and usually covered by intact mucosa. Considering the wide variety of sites affected by the tumor and its variable histological presentation, a correct clinical description is fundamental. Although the etiology of GCT is still controversial, the currently most accepted hypothesis is that the tumor arises from Schwann cells or their precursors^{2,8}. Immuno histochemical analysis has shown a strong and consistent positivity for protein S-100, a finding supporting the hypothesis that GCT is of peripheral nerve sheath origin⁸.

Large lesions of GCT have been reported, including a case of an extensive tumour which occupied the right side of palate from the central incisor to the soft palate.² Some large lesions may show surface ulcerations which may give a clinical impression of a malignant neoplasm. The ulceration in such cases is usually due to local trauma.⁹

In this case even though the patient had given a history of trauma to the area of the lesion while chewing no visible surface ulceration was noted and mucosa overlying was intact. The cusps of adjacent teeth to the lesion were also smooth and intact without any sharp points. The lesion was well circumscribed firm and palpable. All these findings led to changing our mind from the clinical impression of malignant ulcer of tongue.

Most granular cell tumours are found on the head and neck region with the tongue as the most common location with 23–28% of cases. On the tongue, the GCT usually occurs on the lateral border, in a position similar to the usual site of occurrence of squamous cell carcinoma, and may present with similar symptoms, especially, when

the surface of the lesion is ulcerated⁴. In addition, the tongue lesions characteristically show loss of gustatory papillae and atrophy of the overlying mucosa. This modification of the overlying mucosa in the lingual lesions is especially important because the clinical appearance can also mimic a carcinoma. This is another reason why some cases were initially suspected of being squamous cell carcinoma until proved otherwise by histopathological examination³.

GCT seems to be more prevalent among women, but a gender preference is not unanimously accepted. The tumor commonly develops between the second and sixth decade of life⁷ and is rare in children⁸. Clinically, benign GCT manifests as a nodular lesion that is generally asymptomatic and solitary, although cases of multiple lesions have been reported^{7,9}. The tumor presents as a pink or yellow well delimited lesion that rarely exceeds 3 cm in diameter, is covered by intact mucosa, and usually involves subcutaneous or submucosal tissues. There are reports of painful symptoms during tooth brushing, consumption of spicy foods, and bite trauma¹⁰.

In this case the age group of the patient was within the 3rd decade and it was a solitary well circumscribed nodular lesion presenting as yellow well delimited lesion with size less than 3cm and there was no associated pain and lymphadenopathy was negative which had given us a dilemmatic false impression of lipoma as the primary clinical diagnosis.

However our differential diagnosis included irritational fibroma, pyogenic granuloma and minor salivary gland tumour and benign mesenchymal tumour.

Incisional biopsy was not planned as the lesion size was small and lesion characteristics were more suggestive of a benign lesion. The patient was then taken up for excisional biopsy under short GA to have a better access and less discomfort for the patient and to manage uncontrolled bleeding if at all occurred while excisional biopsy.

According to literature surgical excision with a safety margin is the treatment of choice for GCT, although this is not always possible because the tumor lacks a capsule, a condition histologically demonstrated by an undefined cell margin. An excisional biopsy was also the treatment of choice

in the present case, and excision with tumor-free margins was easily achieved due to adequate access to posterior region under proper sedation. The case is being followed up till now for 1 year and no signs of recurrence were observed till date.

Conclusion

In summary, a case of granular cell tumor of the tongue was reported in a 33-years old male patient. The recognition of the unknown neoplasm might help the surgeon for the correct diagnosis and surgical treatment of these tumors. As GCT constitutes a rare lesion, there is a big possibility to misdiagnose. A careful histological examination is the key to achieve the right diagnosis. Morphologically oral GCTs may demonstrate a wide variety of features and architectural patterns, but they all still exhibit a benign behaviour. Furthermore, GCTs could be regarded as lesions that reflect a local metabolic or reactive change rather than a true neoplasm.

Due to this uncommonness of GCT, patients should be informed about its metachronicity and also they should often revisit the hospital, because a close follow-up is very important in any case and especially in tumor cases.

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Sequestrectomy and saucerisation – a novel method for the treatment of chronic suppurative osteomyelitis of mandible

* Sherin A. Khalam, ** Chandoorya C.

*Associate Professor, **PG Student, Dept. of Oral and Maxillofacial Surgery, Rajas Dental College and Hospital, Kavalkinar, Thirunelveli Dist., Tamil Nadu

Send correspondence: Dr. Sharanya Suresh; E-mail: drsherin666@gmail.com

Introduction

Osteomyelitis is an inflammatory reaction to infection of bone caused by pyogenic bacteria. This condition was described by REES in 1947. It involves the periosteum first and rapidly the Haversian system and extending into the medullary portion of the bone. Osteomyelitis is mostly of odontogenic origin like infection from the root canal or root apex, periodontal infection or from the extraction site. It can also be due to trauma, infection from the fracture site. It is more common in mandible rather than in maxilla. The reason for this is maxilla has profuse blood supply, thin cortical plates of maxilla dissipates the pus and discharge into the adjacent soft tissue and paranasal sinuses. Here we present a case of 78 years old male with chronic suppurative Osteomyelitis involving the lower left back jaw region. Symptoms of chronic suppurative Osteomyelitis include pyrexia, deep intense pain, anorexia, and myalgia. The hallmark of chronic suppurative Osteomyelitis is progressive bone destruction and formation of sequestra. It is seen in patients with alcoholism, diabetes, autoimmune disorders, acquired immune deficiency syndrome, malignancy, malnutrition, leukaemia, anaemia, Paget's disease, osteopetrosis, florid osseous dysplasia and in patients under medications like chemotherapeutic drugs, bisphosphonates or steroids.^{1,7,8,9.}

Case report

A 78 years old male patient reported to our Department of Oral and Maxillofacial Surgery with a chief complaint of pain in the lower left back tooth region for past 1 year. (Fig - 1) Pain was sudden

in onset, moderate intensity, continuous and localised in nature. History of extra – oral draining pus 6 month back. Patient was otherwise normal systemically. Patient was a chronic alcoholic for 68 years and stopped 1 year back. Patient had a habit of smoking for past 68 years and stopped a month before surgery. On general examination, there were no significant abnormalities. On Extra – oral examination, facial asymmetry was present due to the swelling, which is a single diffuse swelling measuring 2x2 cm present in the lower third of face extending anteriorly 2cm from the symphyseal region to 3cm in front of the angle anteroposteriorly and super inferiorly it extends from the line joining the corner of the mouth to the tragus to the lower border of the mandible. No colour changes present over the swelling. On palpation it is firm to hard in consistency. Intra-orally necrotic slough is seen in 34, 35 region involving the alveolus and both the buccal, lingual soft tissue with pus discharge. (Fig – 2a, 2b) Teeth 17, 18, 27, 28, 34, 35 were missing with generalised attrition. On palpation tenderness was present in the buccal vestibule in 32, 33, 34, 35, 36 region. Provisional diagnosis was given as chronic suppurative Osteomyelitis. Incisional biopsy, complete blood investigation and Culture sensitivity test were performed. Culture sensitivity tests revealed predominant streptococcus species. So antibiotic coverage was started with clindamycin 150mg twice daily. Radiological examination with OPG and IOPA revealed osteolytic region with localised radiopaque Sclerotic mass suggestive of sequestra in 34, 35 regions with ill defined radiolucency in 34, and 35 region. (Fig - 3) Treatment planned was seques-

treectomy and saucerisation under GA with extraction of teeth in the involved quadrant. Under GA, Sequestrectomy and saucerisation was performed until fresh bleeding is induced and teeth 32, 33, 36, 37, 38 were extracted assuming that it will act as a nidus of infection or may be a reason for recurrence. Necrotic bone along with the extracted teeth was sent to histopathological examination. (Fig – 4a, 4b,

4c) After thorough debridement and irrigation flaps were approximated and sutured with 3-0 vicryl round body. (Fig – 5a, 5b, 5c, 5d) Patient was kept on antibiotics, analgesics and betadine mouth wash. Review was done after 10 days. (Fig- 6a, 6b) There was no post operative complication and the wound healed uneventfully. Post operative OPG showed affected area which is devoid of necrotic mass and



Fig 1 – showing pre-operative view of patient.



Figure 2a, 2b – preoperative picture showing necrotic slough in relation to 34, 35.



Figure 3 – pre operative IOPA showing Osteosclerotic radiopaque mass in relation to 34, 35.

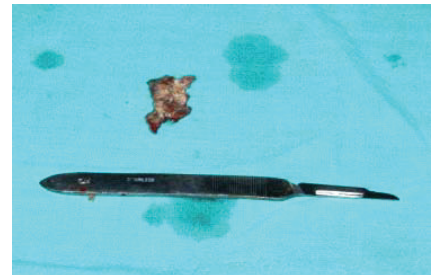
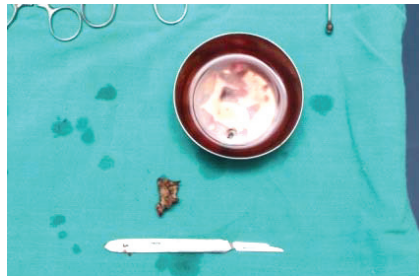
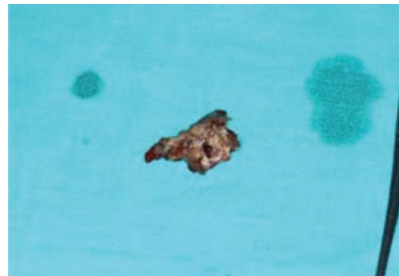


Figure 4a, 4b, 4c – removal of sequestra along with the extracted teeth.

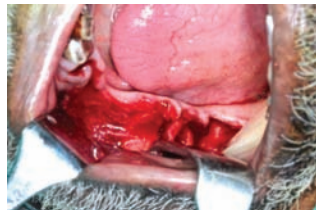
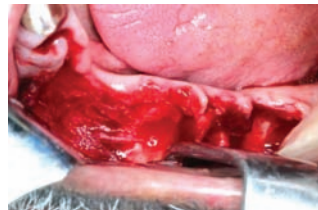


Figure 5a, 5b, 5c, 5d - showing after extraction of teeth 32,33,36,37 & 38 and saucerisation flaps are approximated & sutured with 3-0 vicryl round body.

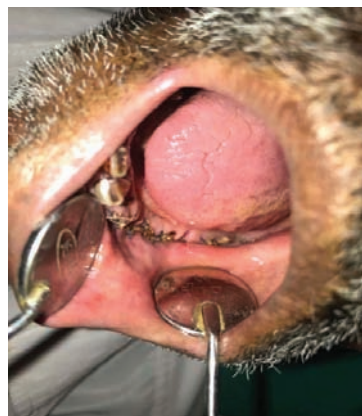


Figure 6a, 6b - showing review done on the 10th post – operative day.

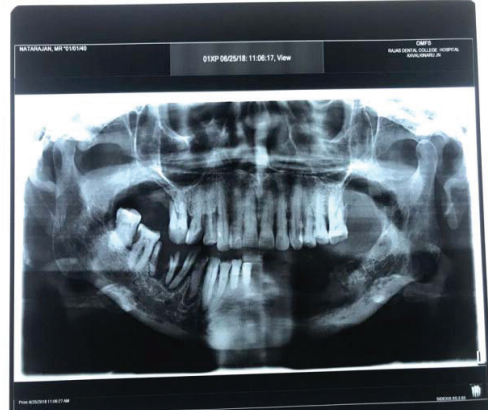


Figure 7 - showing post-operative OPG with removal of sequestra and progression of healing.

progression of healing. (Fig- 7) Clinically it showed complete healing. The histopathological report confirmed it as chronic suppurative osteomyelitis and probably the reason is previous dental extraction which has not healed properly due to habit of smoking which patient had for more than 60 years.

Discussion

Chronic suppurative Osteomyelitis is a disease for which aggressive surgical debridement and prolonged antimicrobial therapy should be indicated. Frequent follow up at regular intervals is mandatory.¹ Cohen et al, had demonstrated the use of both antibiotic and surgery for the treatment of chronic suppurative Osteomyelitis.^{2,3} Delay in the treatment or injudicious use of antimicrobial agents can also result in devastating state.⁴ Osteomyelitis is derived from a Greek word, 'Osteon' referring to bone and 'muelinos' means marrow stating that it is an infection of medullary portion of bone with involvement of mineralised structure resulting in suppuration, resorption, sclerosis and hyperplasia. It can be classified as acute, sub acute and chronic stage depending on the clinical presentation of the disease. Characteristic feature of osteomyelitis is it involves all the three components of bone: periosteum, cortex and medullary cavity. It is referred as chronic suppurative osteomyelitis in Anglo-American texts and can be interchanged with secondary chronic osteomyelitis which is referred in European texts.⁴ Clinically and radiographically it shows a broad variation from osteolytic aggressive putrefactive phase to osteosclerotic dry phase.⁵ Marx and Mercuri were the to describe about acute phase of osteomyelitis which is from the start of the infection to an arbitrary limit of 4 weeks.^{5,6} Four Factors which is responsible for the establishment of the infection in cortex and medullary portion of bone are a. Host response b. Virulence of the pathogen c. number of the pathogen d. Local tissue perfusion. Surgical debridement along with surgical decortication is done to remove the necrotic bone and to bring well vascularised tissue in the affected site that will eventually promote healing and makes the antibiotic reach the target site easily.^{5,7,8,9,10} Antibiotic treatment should be started after isolating the bacteria from the culture. Penicillin is the drug of choice. Alternatives include vancomycin, clindamycin, metronidazole, carbapens, cephalosporins and fluoroquinolones.^{11,12} Differential diagnosis of osteomyelitis includes Paget's disease, fibrous dysplasia, tumours, actinomycosis and osteosarcoma.^{13, 14, 15.}

Conclusion

Osteomyelitis requires both medical and surgical intervention. It can recur if trauma or infection at the surgical site persists. Host response is also a precipitating factor. Acute infection may proceed to chronic if not treated properly taking the non surgical approach to surgical one.

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IDA Attingal Branch Reports & Activities

CDE

Our fourth CDE programme on 'Enduring Endodontics' was conducted on July 1st at Hotel Karthika Park, Kazhakutom. The speaker was Dr Gopikrishnan. Around 94 participants were present.

The lecture was quiet informative. Expecting more and more such wonderful ventures in the future.

CDH

National Oral Hygiene Day was observed at Lotus Edudrops, Pukayilathoppu, Attingal.

Dr Arun S, Dr Vinay Vasudev, Dr Roshith took awareness classes. 111 students and 10 teachers were present at the programme.

IDA RELIEF FUND

The devastating flood of last month destroyed the normal life of so many people including our fellow dentists. IDA KERALA STATE acted swiftly to help the affected dental surgeons, irrespective of their membership in IDA, by starting a relief fund.

IDA ATTINGAL BRANCH was the first branch which contributes Rs 1,00,000/- as initial help. With the help of our compassionate members we expect to raise more fund for the affected..

Two executive committee meeting were conducted so far.

On September 9th a General Body Meeting was conducted at Hotel Anamthara, Attingal. Dr Abhilash GS President Elect, IDA KSB explained about hardships of the affected dentists in the flood hit areas and the state secretary accompanied him at the meeting.



IDA relief fund handed over to state secretary Dr. Suresh Kumar and President elect Dr. Abhilash GS



President Dr. Ramesh addressing the General Body meeting of IDA Attingal.