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Executive Editorial

It is a matter of immense pleasure for me to bring the current issue of our Institutional Journal with a plethora of sensible manuscripts which we are getting to be published in a short span of time in the perspective of contemporary era where publications have just become a means of increasing points for specific purposes.

As I have always maintained that I expect the readers will be benefitted intellectually with the manuscripts selected for the current issue. It is indeed very satisfying to get manuscripts from the colleges countrywide which is an indirect indication that the journal is getting its due impact and place in the society in the word of academics. I wish the journal goes high in its reach simultaneously expressing my desire for support from you all for the journal. Not to mention, mistakes do creep in despite stringent precautions. So, I request the support of all the readers. I also want to invite all for suggestions in improving the journal so that our dream of getting an intellectual boost is met shortly.

With best regards,

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Separated Instrument Retrieval using Ultrasonics in a Permanent Maxillary Second Molar : A Case Report

Dr. Srikanth T.^a, Dr. Tulasi Lakshmi D.^b, Dr. Gowtham Pallamala^c, Dr. CLNV Prasad^d,

Abstract: In routine endodontic practice, clinicians encounter a number of obstructions such as hard, impenetrable pastes, separated instruments, silver points or posts in root canals. Cleaning and shaping of a tooth has a potential impact on the outcome of treatment. Broken instruments usually prevent access to the apex and the prognosis of teeth with broken instruments in the canals may be lower than for normal ones. Ultrasonics has often been advocated for the removal of broken instruments because the ultrasonic tips or endosonic files may be used deep in the root canal system. Furthermore, the use of an ultrasonic endodontic device is not restricted by the position of the fragment in the root canal or the tooth involved. This case report elaborates on retrieval of broken instrument lodged at the junction of coronal and middle thirds of the canal of a permanent left maxillary second molar using ultrasonic technique.

Keywords: separated instrument, ultrasonics

Introduction:

During endodontic therapy, dental instruments might fracture within the root canal. Furthermore, while examining the patient's radiographs for planning re-treatment, the endodontist might unexpectedly encounter one or more retained endodontic instrument fragments. In clinical studies, the incidence of this complication has been reported to range from 0.39%–5%^{1,2}. It has been reported that the prevalence of separated instrument ranges from 2 to 6% by Tronstad et al and 0.5 to 5% by Iqbal et al³. Unfortunately, even with the advent of nickel-titanium (NiTi) alloy which are more resistant to fracture, there has not been any significant decline in the incidence of instrument separation. Whereas separation rates of stainless steel instruments have been reported to range between 0.25 and 6%, the separation rate of NiTi rotary instruments has been reported to range between 1.3 and 10.0%⁴. In a systematic review, Panitvisai et al⁵ assessed the prognosis of teeth after instrument fracture during endodontic therapy and found no statistically significant difference in healing rates between teeth with and without retained instrument fragments. However, the odds of treatment failure are higher when fragments prevent a thorough cleaning and shaping of the

entire canal system and when peri-radicular lesions are present preoperatively⁵⁻⁸. When infection is present, removal or by passing of the fractured instrument is essential to ensure more predictable outcomes. Technological advancements such as the dental operating microscope (DOM) and ultrasonics have enabled enhanced visualization of the operative field and easier manipulation of the root canal respectively^{9,10}. These technologies have made it possible for the clinician to obtain access to the fractured instruments and can secure high success rates in the removal of instrument fragments as reported by Cuje et al¹⁰. Ruddle¹¹ has proposed a technique for the removal of metallic instrument fragments from the root canal by using a combination of Gates-Glidden drills, microscopic magnification and ultrasonic tips. This approach has since been adopted by Ward et al¹² and tested in clinical practice. Different techniques for retrieval of separated instruments include the use of forceps, broaches and files, chemical solvents, hypodermic surgical needles and Masserann kit, however, a standard procedure with definite success rate is still under investigation. Ultrasonic instruments have shown to be very effective for the removal of canal obstructions. Ultrasound vibration is transmitted to the fragment, loosening and eventually

dislodging it from the canal walls. Success rates for fragment removal by using ultrasonics were reported to range from 67% by Nagai et al to 88% and 95% reported recently by Cuje et al and Fu et al respectively.

Case Report: This case report describes the retrieval of separated instrument lodged at the junction of coronal and middle third of the canal of a permanent maxillary left second molar using ultrasonic technique. A 58year male patient reported to the Department of Conservative Dentistry and Endodontics with a chief complaint of incomplete root canal treatment in upper left back tooth region initiated 2 months prior. Patient was asymptomatic. Medical history was not contributory. Clinical examination revealed incomplete access preparation and caries excavation in relation to maxillary left second molar (27). The tooth was not tender on percussion. Periodontal probing depths were normal. Tooth was non-vital. Intra-oral peri-apical radiograph (IOPA) revealed separated instrument fragment extending approximately 2 mm below the canal orifice to the middle third of the mesio-buccal canal without any peri-apical pathology (Fig.1). In the first appointment, caries excavation and access cavity preparation was initiated and modification done. Canal orifices were located using DG16 explorer and were enlarged using Gates Glidden drills (GG) #2, 3, 4 (Mani Inc, Japan). Obstruction to penetration was observed when #15 K file (Mani Inc, Japan) was introduced into the mesio-buccal canal. With aid of magnifying loupes ($\times 2.5$), the coronal end of fractured instrument could be appreciated in the mesio-buccal canal approximately 2 mm below the canal orifice. The presence of instrument fragment in the mesio-buccal canal was confirmed by taking IOPA radiographs from mesial and distal angulations. Under rubber dam isolation, patency of the canals was established with no #15 K file in palatal and disto-buccal canals. The separated instrument was located in the buccal most area of the mesio-buccal canal. H-file was used to bypass the separated file

and then, Ultrasonic tip ET20 ,ET25 (Acteon, Satelec, France) in Satelec ultrasonic hand piece at a power setting of 5 was placed into the mesio-buccal canal between the exposed end of the file and the canal wall and activated around the obstruction to remove dentin around the fractured instrument and loosen it. Following the ultrasonic activation, the instrument fragment floated out from the mesio-buccal canal. The fractured instrument was found to be a K- file, approximately 5 mm in length. The retrieval of separated file from mesio-buccal canal was confirmed by taking an IOPA (Fig.2). Working length was established (VDW, Munich, Germany) and confirmed radiographically. Bio-mechanical preparation was completed using protaper rotary system (Dentsply India Pvt. Ltd.). Mastercone was determined by taking an IOPA (Fig.3). The root canals were obturated by lateral condensation technique using gutta-percha (Dentsply Maillefer, China) and zinc oxide eugenol based root canal sealer. Access cavity was restored with silver amalgam (Fig.4). Further on, the patient then was scheduled for restoration with fixed prosthesis.

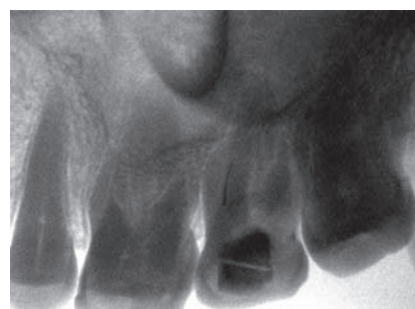


Fig. 1 : Separated file in mesio-buccal canal irt 27



Fig. 2 : Instrument retrieval as confirmed by radiograph

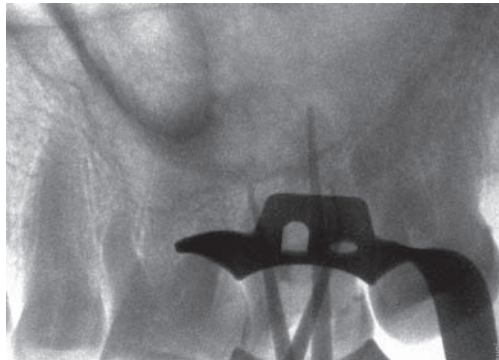


Fig. 3 : Mastercone as determined by radiograph

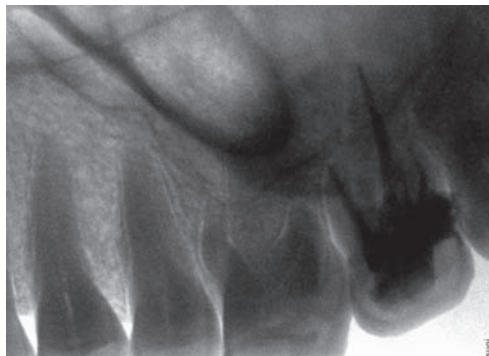


Fig.4 : Post-obturation radiograph

Discussion: Separated file treatment and prognosis of a tooth is based on many factors: canal preparation stage, level of microbial contamination and intra-canal location of separated file^{13,14}. Non-surgical management strategies for file fracture consist of three steps: to bypass the fractured file, removal of fractured instrument from canal space, and if above two are not possible, then prepare and obturate the accessible part of the canal⁶. Presence of separated instrument in the canal hinders accessibility to the apical terminus thus compromising cleaning and shaping procedure. Hence, attempt to retrieve the separated instrument is considered as a more favorable option. However, one should keep in mind that the removal of separated instrument should not weaken the existing radicular tooth structure further as the instrument retrieval systems, such as Masseran kit involves removal of excessive radicular structure in order to gain access to the

separated fragment and retrieving it would lead to root weakening, risk of perforation and post-operative fractures, thereby reducing the long-term prognostic value of the tooth. Ultrasonic technique, however, is simpler and less invasive⁹. The contra-angled design and availability of different lengths and sizes of re-treatment tips enable its use in deeper parts of the canal. In this technique, GG drill with maximum cross-sectional diameter slightly larger than the separated fragment was selected. The bud of the GG drill was altered by cutting it perpendicular to its long axis at its maximum cross-sectional diameter. It was used to create a small staging platform that facilitated the introduction of an ultrasonic instrument. This method was found to be highly effective in retrieval of the separated instrument. Studies have shown that if it is possible to bypass the instrument then, there are more chances of file retrieval. In the presented case, since the canal was ovoid in shape, H file was used to create space between the canal wall and instrument and it was by passed upto 2/3rd of the root canal then ultrasonic tip was placed between the exposed end of the file and canal wall and it was vibrated around the obstruction. With this trephining action and the vibration being transmitted to the separated fragment, the latter often begins to loosen and floats out of the root canal and it happened so in our case too. Care should be taken so that other root canal orifices in the tooth, when present, should be blocked with cotton pellets/gutta-percha to prevent the entry of the loose fragment into these canals. However, during ultrasonics used for separated file removal, precautions should be taken to prevent excessive loss of dentin, perforation, extrusion of the fragment beyond the root and temperature rise on external root surface¹⁵. The ultrasonic re-treatment tip is activated at lower power settings in order to prevent tip breakage and severing of the fractured instrument. Water supply is reduced to enhance visibility into the canal. The activated file should be of a tip size that enables trephination of dentin around the fragment. If excess apical pressure with the ultrasonic instrument is applied, then it may

lead to ultrasonic tip fracture or separated file is moved apically leading to further complication. Also, to prevent separation of the ultrasonic tip, it is important to avoid unnecessary stress by only activating it when in contact with root tissue¹¹. With this, after bypass of the separated file followed by application of the ultrasonic vibrations, it preserves the amount of dentin and reduces the time of retrieval.

Conclusion: Amongst the various methods available for retrieval of separated instruments from root canal, ultrasonic endodontic devices advocated for retrieval of the fractured instruments are highly effective as their use is not restricted by position of the fragment in the root canal or tooth involved.

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Diagnosis of Cutaneous Sinus Tract in Association with Cariously Involved Tooth

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Abstract: The present study reports a case in relation to left posterior region of jaw with pulpal necrosis and periradicular periodontitis, resulting in the occurrence of cutaneous sinus tracts (fistula) to the chin. In this case, previous misdiagnosis and inappropriate medical treatment resulted in non-resolution of the lesion in the patient and left the patient in agony. Only after the patient was referred for opinion, a correct diagnosis was arrived at and treatment rendered. The guideline to diagnose cutaneous sinus tracts (fistula) is based mainly on accurate pulp sensitivity tests of the involved carious tooth. Intraoral and dental examinations are critical in making the diagnosis. The recognition of the dental origin leads to simple and effective endodontic treatment. The cutaneous sinus tract is expected to go for resolution within 7 to 14 days.

Key Words: Pulpal necrosis, cutaneous sinus/fistula.

Introduction:

Although cutaneous sinus tracts of dental origin have been well documented in the medical and dental literature, these lesions continue to be a challenging diagnosis [1, 2]. The discharge of purulent exudates usually is associated with periapical radiolucent area and goes through tissues and structures along the path of least resistance [3]. The site of drainage can be located intra or extraorally, depending on certain circumstances such as: the tooth which is diseased, and the apex position relative to muscular attachments, bacterial virulence and lower host resistance [4].

In a cohort study of 108 odontogenic sinus tracts, Slutzky-Goldberg et al. [5] found just 1 case with cutaneous sinus tract. In the report of Gupta & Hasselgren [6], all odontogenic sinus tracts (29 cases) had intraoral openings. Studies revealed that extraoral sinus tracts are most commonly found on the cheek, chin and angle of the mandible, and in this way making the diagnosis more difficult to the clinician. These authors have reported how important is the interaction between physicians and dentists to avoid submitting patients to multiple biopsies, antibiotic regimens and unnecessary surgery, before correct diagnosis and endodontic therapy are in course [1, 2, 6, 7].

The cutaneous sinus tracts are a sequel to pathosis and that the clinician should be able to

recognize the primary cause. Therefore, taking the patients' history becomes crucial in order to avoid misdiagnosing a wide variety of diseases like ingrow hair, osteomyelitis, local skin infection and neoplasms [8]. The histology of these tracts is often characterized as fragments of granulation tissue that are focally lined by epithelium [9]. Most infections are polymicrobial, and culture often yields growth of anaerobes or facultative anaerobes such as streptococcal species. Chronic specific infections like tuberculosis and actinomycosis can also be a cause of sinus tracts in the head and neck region [10]. It has been observed that systemic antibiotic therapy will result in a temporary reduction of the drainage and apparent healing. Root canal therapy or surgical extraction is the treatment of choice. Antibiotics may be used as an adjunct to treatment in the setting of diabetes, immunosuppression, or systemic signs of infection such as fever [11].

Case Report: A 25 year-old- male patient, with a fistula in the angle of mandible region (Fig. 1) was referred to the dental clinic of the Department of Conservative Dentistry and Endodontics at Sharad Pawar Dental College, Sawangi, Wardha. Patient's medical history was insignificant. Patient complained of pain in the lower left back region of jaw since 8 months which subsided on medication.

Fig.1



Clinical examination revealed a deep occlusal carious lesion in relation to left mandibular first molar (Fig. 2). Pulp sensitivity tests were negative in relation to the same tooth, but the rest of the posterior teeth responded within normal limits.

Fig.2



Radiographic examination of left posterior mandibular region revealed an extensive periradicular radiolucency associated with apical area of the 36 (Fig. 3).

Fig.3



Despite the extensive apical and lateral areas of radicular involvement, mimicking the so called “endo-perio” lesion, the teeth were firm (no signs of mobility), and did not reveal any periodontal pockets on probing. Root canal therapy of the offending tooth was performed and the cutaneous lesion was seen to heal without any surgical or systemic treatment after few days.

Discussion: Cutaneous sinus tract and fistulization of the facial skin have a wide range of aetiologies, the most common being odontogenic in origin. Such patients usually seek help from surgeons or dermatologists rather than dentists and often undergo multiple inappropriate treatments. In diagnosis of cutaneous dental fistula, although the examiner usually looks for dental caries or periodontal diseases, he should bear in mind the possibility of dental traumatic injuries [1, 6, 12, 13]. In several cases of trauma to the teeth, the pulp can be affected, even if the crown-root integrity is not damaged. Odontogenic sinus tracts appear as a papule or nodule with purulent discharge usually in the chin or jaw [14]. Distant location of the sinus tract in relation to the intra-oral focus of infection and the scant of symptomatology may explain why this condition is frequently overlooked [11]. Systemic antibiotic administration is not recommended in patients with a cutaneous odontogenic sinus tract who have a competent immune system. In fact, the fistula prevents swelling and pain caused by the pressure build-up by providing drainage of the primary odontogenic site [1, 2]. Therefore, in extra oral sinus case the pulpal health of the teeth in the contiguous area of cutaneous fistula should be evaluated properly for arriving at a correct diagnosis and getting the patient rid of unnecessary treatment interventions and persistent agony.

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“HERBOSOMES”: When Herbology Meets Nanotechnology

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ABSTRACT: There are many herbal extracts having excellent bioactivity in vitro but less in vivo because of their poor lipid solubility and improper size of the molecule or both, which result in poor absorption and bioavailability of herbal constituents from herbal extracts. Also, they are destroyed in the gastric fluids when taken orally or by topical applications. Herbal medicines have been widely used all over the world since ancient times and by physicians and patients for their better therapeutic value as they have no or less side effects as compared with modern medicines. The term “Herbo” means plant while “some” means cell-like.

Herbosome is a current concept in herbal drug technologies that remove the limitations of the traditional drug delivery systems, is better absorbed and as a result possess better bioavailability and actions than the conventional botanical extracts. Herbosomes are produced by a process whereby the standardized plant extracts or their constituents are bound to phospholipids, mainly phosphatidylcholine producing a lipid compatible molecular complex. The molecular structure of phospholipid includes a water-soluble head and two fat-soluble tails. Because of this dual solubility, the phospholipid acts as an effective emulsifier.

There are a number of traditional herbal remedies for the treatment and management of diseases related to oral and para-oral structures. Herbosome technology has been effectively used to enhance the bioavailability of many popular herbal extracts and phytoconstituents including Ginkgo biloba, milk thistle, grape seed, green tea etc. and can be developed for various therapeutic uses or as dietary supplements. These drug-phospholipid complexes can be formulated in the form of solution, suspension, emulsion, syrup, lotion, gel, cream, aqueous micro dispersion, pill, capsule, powder, granules and chewable tablet. Herbosomes exhibit better pharmacokinetic and pharmacodynamic profile than conventional herbal extracts.

Key Words: Herbosomes, modern medicine, bioavailability.

Introduction:

Herbal medicines, complex chemical mixtures prepared from plants, have been used for health maintenance in ancient times. But many phytomedicines are limited in their effectiveness because they are poorly absorbed when taken via oral route. The Herbosome technology, developed by Indena S.P.A. of Italy, markedly enhances the bioavailability of select phytomedicines, by incorporating phospholipids into standardized extracts and thus significantly improving their absorption and utilization.^[1,2]

The effectiveness of any herbal product is dependent upon delivering an effective level of the active compounds. Most of the bioactive constituents of phytomedicines are flavonoids (e.g. anthocyanidins from bilberry, catechins from green tea, silymarin from milk thistle). However, many

flavonoids are poorly absorbed. The poor absorption of flavonoid nutrients is likely due to two factors. First, they are multiplexing molecules too large to be absorbed by simple diffusion, while they are not absorbed actively, as occurs with some vitamins and minerals. Second, flavonoid molecules typically have poor miscibility with oils and other lipids, severely limiting their ability to pass across the lipid-rich outer membranes of the enterocytes.^[3]

Water-soluble flavonoid molecules can be converted into lipid-compatible molecular complexes called herbosomes. Herbosomes are better able to transition from a hydrophilic environment into the lipid-friendly environment of the enterocyte cell membrane and from there into the cell, finally reaching the blood. The herbosome process has been applied to many popular herbal extracts including Ginkgo biloba, grape seed,

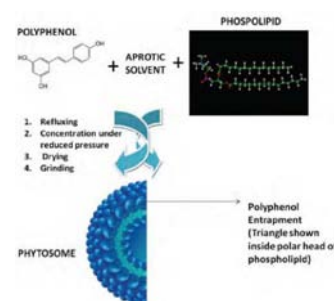
hawthorn, olive fruits and leaves, milk thistle, green tea, ginseng and curcumin. The flavonoid and terpenoid components of these herbal extracts are able to directly bind to phosphatidylcholine. ^[4]

This technology is also useful in pharmaceutical formulations intended for treatment of oral cavity in which the contact times are very short because phospholipid allows a greater adhesion of the product itself to the surfaces it comes into contact with but is itself a bioactive nutrient with documented clinical efficacy for liver disease, including alcoholic hepatic steatosis, drug-induced liver damage and hepatitis. It can also be used in anti-inflammatory activity as well cosmetic compositions.

Methods of Preparation: Mareno and Lampertico (1991), Jiang et al. (2001), Maiti et al. (2006) and Maiti et al. (2006) have reported the methods of herbosome preparation. Herbosomes are prepared by complexing polyphenolic phyto-constituents in 1:2 or 1:1 ratio with phospholipids. Phospholipids that can be used may be either vegetal or synthetic in nature. Generally herbosomes are prepared by reacting one mole of a natural or synthetic phospholipid, such as phosphatidylcholine, phosphatidylethanolamine or phosphatidylserine with one mole of component, for example flavolignanans, either alone or in the natural mixture in aprotic solvent such as dioxane or acetone from which complex can be isolated by precipitation with non solvent such as aliphatic hydrocarbons (n-hexane) or lyophilization or by spray drying. The ratio between these two moieties in the complex formation of phytosomes is in the range from 0.5-2.0 moles. The most preferable ratio of phospholipid to flavonoids is 1:1.

Silybin- phospholipid complex was prepared by Yanyu et al. (2006) using ethanol as a reaction medium. Silybin and phospholipids were resolved into the medium, after the organic solvent was removed under vacuum condition forming the silybinphospholipid complex. Starting material of component like flavonoids are insoluble in chloroform, ethyl ether or benzene. They become

extremely soluble in these solvents after forming herbosomes. This chemical and physical property change is due to the formation of a true stable complex.



General Diagrammatic Representation of Herbosome Characterization and Evaluation of Herbosomes

A flavonoid molecule (lower right) is enveloped by a phospholipid



Arrangement of the herbosomal molecular complex. Preparation

In the herbosome preparations, flavonoids are selected from the group consisting of vitexine, quercetin, kaempferol, quercetin-3, luteolin, rhamnoglucoside, quercetin-3-rhamnoside, hyperoside, diosmine, 3- rhamnoside, (+) catechin, (-) epicatechin, apigenin-7-glucoside, luteolinglucoside, ginkgonetine, isoginkgonetine and bilobetine. Selection of phospholipids is done from the group consisting of soy lecithin, from bovine or swine brain or dermis, phosphatidylcholine, phosphatidylethanolamine, phosphatidylserine in which acyl group may be same or different and mostly derived from palmitic, stearic, oleic and linoleic acid. ^[5,6,7]

PROPERTIES OF HERBOSOMES: Herbosome is a complex between a natural product and natural

phospholipids, like soy phospholipids. Their sizes vary between 50 nm to a few hundred μ m. These phytophospholipid complexes are often freely soluble in aprotic solvents, moderately soluble in fats, insoluble in water and relatively unstable in alcohol. When treated with water, herbosomes assume a micellar shape forming liposome-like structures. In herbosomes the active principle is anchored to the polar head of phospholipids, becoming an integral part of the membrane.

Spectroscopic data reveals that the main phospholipid-substrate interaction is due to the formation of hydrogen bonds between the polar head of phospholipids (i.e. phosphate and ammonium groups) and the polar functionalities of the substrate. For example in the case of the catechindistearoyl phosphatidyl choline complex, there is formation of H-bonds between the phenolic hydroxyl ends of the flavonoid moiety and the phosphate ion on the phosphatidylcholine moiety.

This can be deduced from the comparison of the NMR of the complex with those of the pure precursors. The signals of the fatty chain are almost unchanged. Such evidences inferred that the two long aliphatic chains are wrapped around the active principle, producing a lipophilic envelope, which shields the polar head of the phospholipid and the catechin. ^[8,9,10]

Advantages of Herbosomes:

1. Potential enhancement of bioavailability.
2. Herbal herbosome process produces a little cell whereby the valuable components of the herbal extracts are protected from destruction by digestive secretions and gut bacteria.
3. Pharmacologically Assured delivery to the different biological tissues.
4. No compromise of nutrient safety.
5. Less dose requirement is due to absorption of chief constituents.
6. Drug loading efficiency is so high and more over predetermined because drug itself in conjugation with lipids is forming vesicles.
7. No problem of drug entrapment.

8. Herbosomes shows better stability profile because chemical bonds are formed between phosphatidylcholine molecules and phytoconstituents.

9. Phosphatidylcholine used in the herbosome process which acting as a carrier and also nourishes the skin, because it is essential part of cell membrane.

10. Herbosome is also superior to liposomes in skin care products.

11. Significantly gives greater clinical benefit than liposomes.

12. The structure of herbosome elicits peculiar properties and advantages in cosmetic application.

13. Significantly Enhanced ability of herbosome to cross cell membranes and enter cells.

14. Their low solubility in aqueous media allows the formation of stable emulsions or creams.

Herbs in Periodontics:

Acacia Catechu wild: (Fam. Mimosae, Hindi- Khair, English- Citchtree, Sanskrit- Khadira)

A. catechu is used as mouthwash for mouth, gum and throat disease like gingivitis, stomatitis. Kattha is cooling, digestive, astringent and used for its therapeutic advantages in bleeding piles, uterine hemorrhages, leucorrhoea, atonics dyspepsia, chronic bronchitis, etc. ^[11]

Aloe Vera Miller: Aloe vera is *Aloe barbadensis* Miller. (Fam. Liliaceae). The species is frequently used in herbal medicines and cosmetics. Traditionally, Aloe was used topically to heal wounds, skin diseases and orally as a laxative. It is also used in conditions including diabetes, asthma, epilepsy and osteoarthritis. ^[11]

Azadirachata indica (Neem): *Azadirachata indica* A. Juss. is well known in India and neighboring countries as the most versatile medicinal plant. Neem oil, bark and leaf extract have been therapeutically used as folk medicine to control leprosy, intestinal helmenthiasis, respiratory disorders, constipation and as health promoter. Studies indicate that neem leaf extract possess antiarrhythmic, antiarthritic,

antiviral, antioxidant, hepatoprotective and antidiabetic activity. ^[11]

Glycerrhiza Glabra (Liquorice): Glycerrhiza glabra, commonly known as liquorice and sweet root. Liquorice is used for treating upper respiratory ailments including cough, sore throat and bronchitis. ^[11]

Ocimum Sanctum L. (Tulsi): Tulsi is used to control diabetes. Paste of leaves is found effective in the treatment of ringworm and other skin diseases. The seed are mucilaginous and demulcent and given in disorders of the genitourinary system. The leaves have also been shown to possess good anti-stress and analgesic activity. ^[11]

Curcuma Longa (Turmeric): Turmeric commonly known as Haldi has antimicrobial, antioxidant, astringent, and other useful properties, it is quite useful in Dentistry also. ^[11]

Matricaria Chamomile (Camomile): Chamomile flowers are also used for their anti-inflammatory and antispasmodic properties. The flowers are sometimes added to cosmetics as an anti-allergenic agent or made into a salve for use on hemorrhoids and wounds. ^[11]

Commercial Applications of Herbosome: The current research shows enhanced absorption and bioavailability with herbosome as compared to conventional means. Most of the Commercial Preparations of herbosome are available easily these days as shown in Table 1.

Conclusion: A wide number of phyto chemical constituents are isolated from herbal drugs with mostly the flavonoidal and the terpenoidal fraction furnishing with a number of applications. The poor absorption and the poor bioavailability associated with the polar phytoconstituents limits their use. The poor bioavailability can be removed by formulating an appropriate drug delivery system like Herbosome (Phospholipids) based drug delivery system promising a better and effective delivery of drug and can increase their bioavailability rate and extent of drug absorption across the lipoidal

biomembrane. Herbosome are one of the phospholipids based herbal drug delivery systems with a better absorption and stability profile as compared to other phospholipids based drug delivery system. Pharmacologically active herbal plants like Acacia catechu, Aloe vera, Chamomile, Azadirachata indica and Glycerrhiza glabra are found to be useful in the prevention, treatment and maintenance of a number of periodontal diseases.

Herbosome can play a vital role in valuable delivery of phytoconstituents such as the flavones and the xanthenes. Herbosome also have a wide scope in herbal formulations and cosmetics as well. Many areas of herbosome will be revealed in the future as part of their pharmaceutical use.

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Table 1: Commercially available herbosome preparations:

Commercially available preparations	Phytoconstituents	Indications
Silybin herbosome TM	Silybin from <i>Silybum marianum</i>	Food product, hepato-protective, Anti-oxidant for skin and liver
Ginkgo herbosome TM	24% Ginkgo Flavonglycosides from <i>Ginkgo biloba</i>	Protect brain and vascular lining, anti-ageing agent
Ginseng herbosome TM	37.5% Ginsenoside from <i>panax ginseng</i>	Food product, Nutraceutical, immunomodulator
Green tea herbosome TM	Epigallocatechin-3- O-gallate from <i>Camelia sinensis</i>	Neutraceutical, Systemic anti-oxidant, anti-cancer
Grape seed (PCO) herbosome TM	Procyandine <i>Vitis vinifera</i>	Neutraceutical, Systemic anti-oxidant, cardio-protective
Hawthorn herbosome TM	Flavonoids <i>Crataegus sp.</i>	Food product, hypertension and other heart diseases
Centella herbosome	Terpenes	Vein and skin Disorders
Olive oil herbosome	Polyphenols from <i>Olea europaea sp.</i>	Anti-oxidant, Anti-inflammatory,
Echinacea herbosome	Echinacosides from <i>Echinacea angustifolia</i>	Anti-hyperlipidemic Neutraceutical, immunomodulator
Curcumin herbosome	Curcumin <i>Curcuma longa</i>	Anti-oxidant, Anti-inflammatory
18β-glycyrrhetic acid herbosome	18β-glycyrrhetic acid from <i>licorice rhizome</i>	Soothing
Centella herbosome*	Triterpenes from <i>Centella asiatica leaf</i>	Cicatrizing, trophodermic
Crataegus herbosome*	Vitexin-2'-O-rhamnoside from <i>hawthorn flower</i>	Anti-oxidant
Escin β-sitosterol herbosome*	Escin β-sitosterol from <i>horse chestnut fruit</i>	Anti-oedema
Ginkgo biloba Terpenes herbosome*	Ginkgolides and bilobalide from <i>Ginkgo biloba leaf</i>	Soothing
Ginkgo biloba Dimeric Flavonoids herbosome*	Dimeric flavonoids from <i>Ginkgo biloba leaf</i>	Lipolytic, Vasokinetic
PA2 herbosome	Proanthocyanidin A2 from <i>horse chestnut bark</i>	Anti-wrinkles, UV protectant
Sericoside herbosome*	Sericoside from <i>Terminalia sericea bark root</i>	Anti-wrinkle
Silymarin herbosome* Virtiva*	Silymarin from <i>milk thistle seed</i> Ginkgo flavonglycosides, ginkgolides, bilobalide from <i>Ginkgo biloba leaf</i>	Anti-hepatotoxic Vasokinetic
Visnadex*	Visnadin from <i>Amni visnaga umbel</i>	Vasokinetic

Alveolar Decortication as a part of Pre-Orthodontic Periodontal Therapy

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Abstract: The dental disciplines of orthodontics and periodontics go hand in hand. The development of new treatment options in periodontics and orthodontics, offer symbiotic ways in treatment of periodontally affected patients where the orthodontic treatment aims at providing functional occlusion and is strongly related to interactions of teeth with their supportive periodontal tissues. Much has been discussed about the role of orthodontic therapy in periodontics. Very few have discussed the vice versa. This literature review attempts to outline the role of alveolar decortication as a part of pre-orthodontic periodontal therapy.

Keywords: Wilkodontics, AOO, Corticotomy

Introduction:

Over the last two decades, the refinements of an attempt to engineer an “optimal response” of alveolar bone to applied “optimal force” has propelled both the periodontal and the orthodontic specialties directly into the field of surgical dentofacial orthopedics. Specifically, the molecular dynamics of osteogenesis in stressed bone defines pathways similar to steady-state homologues not yet fully defined.. The spirit of interdisciplinary collaboration in dentistry has taken traditional orthodontic tooth movement protocols and synthesized periodontal tissue engineering and regenerative surgery, not only toward a method of rapid orthodontic tooth movement but also provided every young clinician with a protocol that also reduces side effects, like root resorption, relapses, inadequate basal bone, dental caries and infection.¹

History: Distraction osteogenesis (DO) was first used in orthopedic medicine in the early 1900 but Russian orthopedic surgeon Dr Gabriel Ilizarov perfected the technique and proved that stressing a bone increases metabolic activity and cellular generation, also known in orthopedic science as ‘bone remodeling,’ resulting in growth of new bone. The phenomenon was named DO—growth of new bone by means of surgically ‘distracting’ the bone.²



Dr Gabriel Ilizarov



In 1960, Heinrich Kule set the stage for the subsequent evolution of refined decortication-facilitated orthodontics. Meanwhile, distinguished orthopedist Harold Frost realized that there was a direct correlation between the degree of injuring a bone and the intensity of its healing response. He called this the rapid acceleratory phenomenon (RAP) where there is a temporary burst of localized soft and hard tissue remodeling (i.e. regeneration) which rebuilds the bone back to its normal state. In the 1990s, the Drs Wilcko, using computed tomography, discovered that reduced mineralization of the alveolar bone was the reason behind the rapid tooth

movement following corticotomies. They used their knowledge of corticotomy and their observations of RAP to develop their patented periodontally accelerated osteogenic orthodontics (PAOO) technique in 1995.³

Concept: Unlike a usual corticotomy, PAOO does not just cut into the bone, but decorticates it—that is, some of the bone's external surface is removed. The bone then goes through a phase known as osteopenia, where its mineral content is temporarily decreased. The tissues of the alveolar bone release rich deposits of calcium, and new bone begins to mineralize in about 20 to 55 days. While the alveolar bone is in this transient state, braces can move teeth very quickly, because the bone is softer and there is less resistance to the force of the braces. Research has shown that after the alveolar bone heals and the teeth are in their new desired positions, additional alveolar bone has formed.

The Drs Wilcko, and other researchers have proven that the aftermath of PAOO is as stable and long-lasting as conventional orthodontic treatment. So, after PAOO, the alveolar bone is apparently not only as strong as it was before the procedure but there is actually more to it—which is advantageous if the profile needs to be built up to improve the facial esthetics.⁴

Advantages^{4,5} :

The potential advantages of the treatment in comparison with traditional orthodontics are:

1. Enhanced scope of malocclusion treatment (ie, an increase in the limits of tooth movement and a decreased need for extractions).
2. Decreased treatment times (increased rate of tooth movement).
3. Increased alveolar volume and a more structurally complete periodontium (correction of preexisting bony dehiscences and fenestrations).
4. Alveolar reshaping for the subtle enhancement of a patient's profile when indicated. (The alveolar chin prominence cannot be advanced except by genioplasty.)
5. Simultaneous rapid recovery of shallow unerupted teeth (deep impaction cases must be done in stages).

Disadvantages:

1. Expensive procedure
2. Mildly invasive surgical procedure and like all surgeries, it has risk of some pain, swelling and the possibility of infection
3. Patients who take NSAIDs on a regular basis or have other chronic health problems cannot be treated with this technique
4. It does not lend itself to class III malocclusion cases.

Regional Acceleratory Phenomenon: Orthopedist Harold Frost recognized that surgical wounding of osseous hard tissue results in striking reorganizing activity adjacent to the site of injury in osseous and/or soft tissue surgery, collectively termed this regional acceleratory phenomenon (RAP).⁶

RAP healing is a complex physiologic process involving accelerated bone turnover and decrease in regional bone densities. Following surgical wounding of cortical bone, RAP potentiates tissue reorganization and healing by way of a transient burst of localized hard and soft tissue remodeling.⁷

Surgical Technique: A treatment plan is developed by an orthodontist/surgeon team to determine the teeth that will undergo bone activation. Occasionally, temporary anchorage devices, miniscrews or plate-retained fixtures, are included in the treatment plan. The team must also orchestrate the sequencing of the different aspects of the treatment, such as the inclusion of forced eruptions, orthognathic surgery, and post-treatment prosthetics. Typically, the orthodontic brackets are placed and a light wire engaged sometime during the week before the surgery with the subsequent orthodontic adjustments being made at 2-week intervals. A full case in which upper and lower arches are treated surgically can require 3 to 4 hours to complete and is usually performed under intravenous or oral sedation. In general, full-thickness flaps are reflected labially and lingually using a sulcular releasing incision. The interdental papillae can be reflected with the flaps or left in place. The releasing incision can also be made within

the thickness of the gingival attachment or at the base of the gingival attachment (mucogingival junction).⁸



Decortication Procedure

Manner Of Tooth Movement: In corticotomy-facilitated orthodontics, the optimal tooth movement seemingly occurs when only a thin layer of bone overlies the root prominences in the direction of the intended tooth movement in close approximation to the osseous insult.^{1,5}

This thin layer of bone demineralizes and the remaining soft tissue matrix and islands of osteoid transported with the root surfaces remineralizes at the completion of the orthodontic therapy. The rapid tooth movement after corticotomy-facilitated orthodontics would thus more appropriately be described as “bone matrix transportation” and not “bony block movement.” In adolescents, the demineralization/ remineralization of the alveolar housing is seemingly complete, without a net tissue loss. In the adult population, however, the remineralization is less complete, albeit to a clinically insignificant degree.^{1,9} This is likely attributable to the decreased vitality of adult tissues in comparison with adolescent tissues. The tooth movement in this treatment is merely the result of a physiologic process and not the repositioning of segments of bone. An uninterrupted blood supply is essential. Conversely, in dental distraction osteogenesis, the outlined segments of bone can be luxated (green stick fractured), but in this situation, a flap of tissue remains attached to the segment of bone.^{10,11}

Recovery: Total recovery from the procedure takes 7 to 10 days. There might be some swelling and it might require use of ice packs. Narcotic pain killer is prescribed for one week postsurgery. The surgery usually does not result in facial bruising. During this time, chlorhexidine mouthwash is prescribed.¹

Orthodontic Adjustments after Surgery^{12:} After complete recovery from the procedure, orthodontist adjusts the braces about every 2 weeks. Depending on case, braces are put for 3 to 9 months. After the braces are removed, a retainer for at least 6 months is usually recommended.

Effect of Drugs^{13:} Patients who have been on long-term corticosteroid therapy may have devitalized areas within the bone and as such are not good candidates for the treatment. Patients who are taking any medication that slow bone turnover are likely not suitable for this treatment. Bisphosphonates can have a half-life exceeding a decade, and even after cessation of therapy these patients are not candidates.

The non-steroidal anti-inflammatory drugs are prostaglandin inhibitors, and their usage will lead to decreased osteoclastic activity and so, amount needed for pain control should be avoided during the active treatment, but nonsteroidal anti-inflammatory drugs can be prescribed for the first week after surgery as analgesics. Any pre-existing oral infections should be resolved before treatment. Retaining teeth with unresolved endodontic problems can be especially problematic and must be extracted.

Conclusion: Regarding the mode of movement, this is the technique that requires the demineralization of a relatively thin layer of bone on the root surface of the tooth in the direction of the intended movement. This transient, reversible osteopenia of the thin layer of bone permits the root of the tooth to carry the demineralized collagenous matrix of the bone with it and a reactionary bone formation.¹⁴

This results in a net increased alveolar volume, which can provide for a more intact periodontium, a decreased need for extractions, a degree of facial reshaping, and an increase in the bony support for both the teeth and the overlying soft tissues.

Hence, it is a combination of selective alveolar decortication with alveolar augmentation and orthodontic tooth movement. The PAOO technique requires the utilization of numerous modified diagnostic and treatment parameters, but once these are mastered, the orthodontist after the PAOO technique has a powerful new treatment option to offer the patients.¹⁵

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A Case Report of Long Maxillary Canine with two root canals

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Abstract: Clinician need to have intimate knowledge and thorough understanding of both pulp chamber and root canal anatomy. They should be aware of the possibility of anatomical variations in the root canal system during endodontic treatment. Maxillary canines usually have single root with single root canal but rarely may have two root canals. This case report describes a longer maxillary canine root with two root canals.

Keywords: Maxillary Canine, Root Canal Anatomy.

Introduction:

Thorough knowledge and understanding of pulp chamber and root canal system anatomy is essential for successful root canal therapy. Familiarity with variations in tooth anatomy and characteristic features in various racial groups can aid location and negotiation of canals.¹ Missed extra root canals are major reason for endodontic failure.²

Pulp canal system is complex with branching and divisions throughout the root length. Vertucci classified the root canal configurations of human permanent teeth into eight types ranging from single to three distinct canals.³

Permanent maxillary canines are more commonly single rooted, single canal teeth. Presence of two root canals is a rarity.⁴ Majority of them join in apical third and exit as single apical foramen.⁵

This case report presents a permanent Maxillary canine having two root canals exiting as single foramen.

Case Report: A 35 year old female patient reported to the dental clinic with a chief complaint of severe pain from four days in relation to left maxillary anterior region. Subjective symptoms included sharp, severe, continuous, throbbing pain which was aggravated by taking hot foods and was relieved by medication. Past medical history was non-contributory. Oral examination revealed deep carious lesions involving maxillary left and right canines. The teeth were negative to percussion test and were found to be non-vital using electrical pulp tester with an exaggerated response to cold test.

No mobility was recorded. Radiographic examination revealed abnormal root canal morphology. A diagnosis of acute irreversible pulpitis of 23 was established and endodontic treatment was planned. Following local anesthesia with 2% lidocaine, the tooth was isolated with rubber dam (Hygienic; ColteneWhaledent), and an endodontic access was made on palatal side with #1014 round bur and endo-Z carbide bur. The vital pulp tissue was extirpated and initially two canal orifices were located. Working length of 31 mm was measured by using K flex files #15 of length 31mm. The palatal canal joined the buccal canal in apical third of root (Vertucci type II canal configuration). Crown down root canal preparation was done, the coronal and middle thirds were prepared using Gates Glidden drills #1-3 (Tulsa Dental, Dentsply) and apical preparation by hand K flex files (Dentsply) to size #40. Copious irrigation with 5.25% sodium hypochlorite and 17% EDTA were performed after use of each file. 2% chlorhexidine was used as the final irrigant. The canals were dried with paper points and obturated with gutta-percha and AH Plus sealer (Dentsply De Trey GmbH, Konstanz, Germany) using a lateral condensation technique. The patient was asymptomatic during the 3 month follow up.

Discussion: Debridement of root canal to remove pulpal remnants, bacteria and their byproducts before obturation is a primary requisite for successful endodontic treatment. Unable to locate and fill a canal results in failure of root canal therapy. Therefore, it is imperative to have a sound

knowledge of anatomic variations as endodontic success is related to an efficient canal debridement.⁶ The diagnostic difficulty and possible canal superimposition on radiographic examination should be kept in mind when examining such cases. When locating extra canals, identification of periodontal ligament space that often projects onto root surface resembling a canal should be differentiated. Vertucci (1984)⁷ classified root canals according to number of canals present and their configuration into eight types.

Anatomic anomaly observed at first appointment should be checked for similar anomaly of tooth on other side⁸. Caliskanet al.⁹ studied root canal number, configuration, and ramifications of permanent teeth in Turkish population. They reported percentage of vertucci type III(1-2-1) and Type V (1-2) as 4.35 and 2.17 respectively. Alapati et al.¹⁰ and Onay et al.¹¹ reported a maxillary right canine with type II canal configuration and Weisman¹² also reported a bi-rooted maxillary left canine.

In the present case, the maxillary canines had an unusual root length of 31mm which necessitated use of lengthier k flex files of 31 mm removing silicone directional stopper before use. They showed canal configuration of type II similar to reported by Alapati et al and Onay et al. Two distinct canal orifices were located in labial and palatal direction which joined in apical third, forming a type II configuration.

Teeth with type II configuration during treatment may pose problems. The canal that is in line with the main passage is usually amenable to adequate enlarging and obturation procedures, the preparation and filling of other canal is often extremely difficult.¹³ A thorough knowledge of root canal anatomy and operator skill is therefore essential for endodontic success. Careful clinical examination with radiographs from different angles may lead to suspicion or identification of additional canals and leads to higher possible success.³

CONCLUSION: Several variations exist in the root canal system and clinicians should be aware of the

variations for complete infection removal and prevention of reinfection. Special care with careful endodontic exploration, different angle radiographs and magnification with surgical microscope aids in detection and treatment of extra canals.

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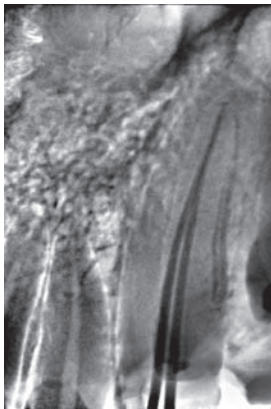
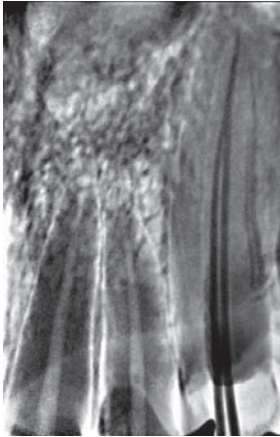


Fig 1: Radiograph showing working length of Master cone Gutta-percha

Fig 2: Radiograph showing maxillary canine with two separate canals

Fig 3: Post operative Radiograph obturated with Gutta-percha & AH Plus Sealer

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Clinical Orthodontic Photography in Dental Colleges in India : A Questionnaire Study

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Abstract:

Context: A good dental photography protocol greatly enhances the dental practice.

Aim: To assess photographic practices in various dental colleges within India.

Methods: The questionnaire was created online using “Kwiksurveys” and was emailed to 170 dental colleges registered with Dental Council of India.

Result: Most of the trainees took the photographs on their own using DSLR camera with a minimum of 3 sets of photographs which included pre-treatment, post-treatment and one set of mid- treatment photographs. These photographs were mainly stored on pc hard-drives.

Keywords : Orthodontic photography

Introduction:

Clinical photography is an essential tool in modern orthodontics. Photographs can be used to aid treatment planning (history taking and diagnosis), evaluation of treatment carried out (tooth movements and mechanics) and also for teaching purposes from formal lectures to simple chair-side patient education. From a medicolegal viewpoint, photographs can be helpful in obtaining informed consent and provide clear images of baseline presentation as well as treatment progress.^{1,2} Maintenance of dental records is legally mandatory in most of the European and American countries. Unfortunately, the law is not very clear in India and the awareness is very poor.^{2,3} The Indian Orthodontic Society has not stipulated any clear guidelines on the use and storage of digital photographs. However, it must be recorded when they are taken and if it is possible to recognise an individual, specific written consent is required. A suitable camera should be reliable, simple, have a macro lens with consistent magnification, have a good quality flash and produce a good image quality. In recent times, professional digital imaging has been proven to be the most acceptable form of image capture due to its many advantages including rapid review of image quality and ease of storage.^{4,5}

Aim: To assess the current clinical Orthodontic photographic practices in India.

Materials and Methods: The study was an e-mail-based questionnaire. The questionnaire was created online using “Kwiksurveys” and was e-mailed to 170 dental colleges registered with Dental Council of India. All the selected colleges were also sent an invitation with a letter of introduction requesting their participation. The questionnaire consisted of the following questions

1. Who takes the clinical photographs?
-Orthodontic Trainees -Professional photographer
2. How often photographs are taken?
- Only pre and post treatment -Atleast one stage photographs -All stage photographs
3. Why do you take photographs?
- Evaluate treatment changes -Treatment planning
-Demonstration -Publication
4. Whether do you take a separate photographic consent?
-Yes -No
5. In what format images were stored in?
- Digital (soft copy only) -Printed copy only -Both prints and soft copy
6. How images were stored and backed up?
- Hospital Server -CD/DVD -Hard drive
7. Which cameras were used?
-DSLR -Semi SLR -Point and shoot

The responses were later compared to current recommendations and guidelines for clinical photography.^{1,2} Data were analyzed using SPSS software (Statistical Product and Service Solutions) version 14.0 provided by IBM Corporation which was

used to conduct *post hoc*, analysis of variance (ANOVA) and students t-test.

Results: 131 out of 170 colleges returned their surveys with the response rate of 77 percent. (Graph1) In 80% of the Dental Colleges, orthodontic trainees took their own clinical photographs. However in rest of the colleges, photographs were taken by a professional photographer specialized in taking orthodontic photographs. (Graph 2) With regard to the frequency of obtaining images, pre-treatment and post-treatment series were taken by 90% with 80% taking at least one mid-treatment series and 60% all stage photographs. (Graph 3) There was universal agreement that photographs were useful in demonstrating potential treatment options and in treatment success (100%). The figure was also high for their potential use in publications (90%), in terms of demonstrations during lectures (70%) and treatment planning (70%). None of the respondents were taking separate photographic consent within their departments. In 90 percent of the departments, both digital and print copy was stored. However, in rest 10% only digital copies were stored. Of the records taken, only 8% colleges stored digital records on hospital server, 10% on CD/DVD's and 82 % on PC hard drives.(Graph 4) Almost all the colleges used DSLR cameras without exception.

Discussion: It is reassuring to see that most departments and trainees were taking their own photographs. This helps to maintain the quality/relevance/appropriateness of photographs taken. The frequency was at the very least adequate with most departments taking start, finish and at least one mid-treatment photographic series. It was disappointing that clinical photographs were not being used routinely for treatment planning and monitoring treatment progress. In our opinion, these images provide a very useful aid to history taking, diagnosis and patient treatment progress particularly in the early stages of orthodontic postgraduate training. The images can be reviewed outside of clinical time and magnified on screen. Many features that could have been missed in the original clinical examination and on a very busy

teaching clinic can often be picked up. Together with study models and radiographs, they can assist in the treatment planning process. Serial photographs provide the patient and clinician a guide to treatment progress and allow tooth movements and mechanics to be evaluated. The original malocclusion may be recalled and any changes judged accordingly. Informed consent is a medico-legal requirement in orthodontics.² One survey showed that of the 222 consultant orthodontists held on the database of the British Orthodontic Society, only 41% of clinicians obtained written consent prior to commencing treatment.⁶ Clinical photography can be both an aid to obtaining informed consent and requires separate written consent itself, especially if an individual may be recognised. The Department of Health further states that it must be explained to the patient why the image is being taken and its intended use. Consequently, the finding from this study that only none of the colleges were taking a separate consent for clinical photographs is a concern. It is encouraging that all the respondents were using digital photography and storing images in this format. It is surprising only 8% had college servers to store images. The hospital server is likely to be the most secure place to store a large number of digital images with the greatest capacity. All the respondents used DSLR cameras for clinical photography. The cameras most commonly recommended for orthodontic use are Nikon D100 (Fig.1) together with the Fuji S1/S2 Pro (Fig.2).⁷

Conclusion: More consistency is required across the region and the departments should conform to current recommendations.

Recommendations:

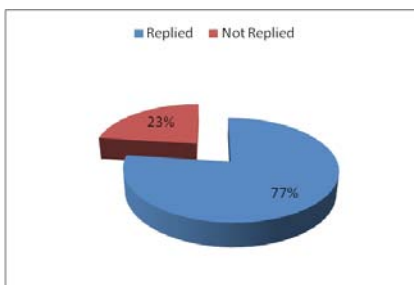
- Trainees should at least attend a relevant course, even if they don't have the facilities at their place of training
- Each case should have at least start, mid treatment and finish photos
- Separate consent is required for clinical photographs
- To comply with WHO Medical record manual a guide for developing countries

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Graphs:



Graph 4

Figures with Legends:



Fig.1: Nikon D100



Fig.2: Fuji S1

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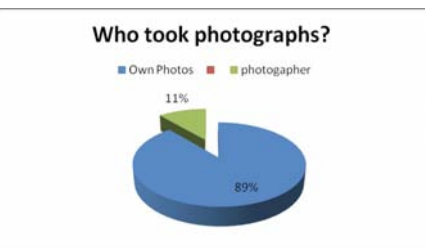
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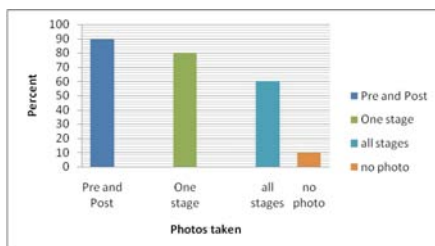
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Graph 1



Graph 2



Graph 3

Astrosmiles: A Fusion of Good Luck, Good Health and Aesthetics

Dr. Yajuvender Singh Hada^a, Dr. Navdeep Jethi^b, Dr. Ankit Jain^c, Dr. Abhishek Metha^d

Abstract: *Astrosmile* is defined as the fusion of good luck, health and aesthetics which can be achieved by the use of *rashi ratna* or birthstone as the tooth jewellery and wearer can get the dual benefits of the fashion dentistry and the astrology. The procedure to get an *Astrosmile* is very conservative and there is minor to negligible damage of the tooth structures.

Keywords: Astrology, fashion dentistry, tooth jewels, birthstones

Introduction:

We have heard about 'million dollar smile' and also a 'devil's smile' but now we are introducing a new term to dental vocabulary, the '*Astrosmile*' which is the fusion of good luck, health and aesthetics.

As a dentist we are very familiar to this term "aesthetics", but how a smile can impart you good luck and health? Answer to this simple question is by the use of birthstones or *Rashi Ratna*. Our ancestors used to wear them in their rings and pendants, as these birthstones are considered as the emitters of positive vibes which can reduce anxiety, anger and aura defects. These three evil A's are the cause behind circulatory disorders, hypertension and many more.

In this fashion oriented generation everybody wants to shine like a star and the tooth jewels and oral piercings are the new trend of fashion dentistry. People want to imitate 'Rihanna's (Hollywood Singer) tooth gems. Also embedding a ruby in the tooth is considered a sign of wealth and prosperity in the society.

We can get the dual benefit of art and science that is astrology and fashion dentistry by the use of birthstones as the tooth jewels. In suitable size and forms, birthstones can be made available in the dental clinics to impart people with *Astrosmiles*.¹

Why birthstone or Rashi Ratna?

'Beauty lies in the eyes of the beholder', goes the saying. The need or want for beauty has existed since time immemorial. The earlier concept of beauty was

based on the traditions set by the ancestors and religious rituals performed by the particular community. Our contemporary beauty standards are set by movie stars or famous personalities. What they wear or what they alter in their physical appearance is quickly emulated by millions of people. Dentistry has travelled a long way from restoration and pain relief to beautification, and dentists facing challenges from demanding patients who desire perfectly aligned sparkling white teeth and still more- tooth jewellery (Figure.1).²

Birthstones or *rashi ratna* can be chosen as a tooth jewel because:

1. There is a wide range of believers in astrology across the globe.
2. Its looks fashionable and trendy as everyone want to smile like a star.
3. Gems affect the human body, giving either good or bad effects. Every gem has the power to absorb the radiation emitted by a particular planet. Gems are beneficial especially from health point of view.
4. In dentistry, birthstones can also be used for the non destructive management of white spot lesions.
5. We can get good health and good luck.
6. This concept of tooth jewellery is much more logical than the previous one of , senseless oral piercings

Ayurvedic recommendations

Ayurveda or Ayurvedic medicine is a system of Hindu traditional medicine native to the Indian subcontinent. Practices derived from Ayurvedic traditions are a type of alternative medicine.²

According to ayurveda, three positive 'M's are useful to cure disease and for maintaining sound health and these are: 1) Mani; 2) Mantra and 3) Medicines. In these three, mani is the synonym for the gemstones or birthstones or rashi ratna. In ayurveda, wearing of some stones is suggested for the cure of some specific disease which is tabulated as follows:³

Diseases	Gemstones Recommended
Alcoholism	Blue sapphire, Amethyst and white Sapphire
Allergies	Cat's eye , Gomedh
Diabetes	White coral, White sapphire
Arthritis	Red Coral
Asthma	Chrysoberl
Fevers	Pearl
Eye infections	Ruby and Quartz
Epilepsy	Emerald, yellow sapphire
Body pains	Garnet, Blue sapphire
Cold , Sinus	Gomedh

Table 1: Disease and Their Recommended Birthstones

As per ayurveda there are seven elements in the body that maintain good health and are cause of growth of body and disease, seven planets control these elements and stones for these planets are:^{3, 4}

Sun	Ruby
Moon	Pearl
Mars	Red Coral
Mercury	Emerald
Jupiter	Yellow Sapphire
Venus	Diamond
Saturn	Blue Sapphire
Ketu	Cat's Eye

Table 2: Planets and Their Gemstone

Healing power of birthstones:⁴

Ruby: Increases vitality of the body and builds immune power of the body system. It has positive effect on heart and reduces the chances of back pain, eye trouble, and fire accident, gastric and peptic

ulcer. It is said that the ladies should avoid it as it destroys the lustre of the body.

Pearl: It has effect on mind and it controls the mental diseases such as insomnia and poor memory. It gives peace of mind. It controls the diseases of lungs, breast, heart, diabetes, piles, diarrhoea, and deficiency of calcium. Pearl is useful for ladies as it increases the lustre of face and increases the strength of sex. It makes their conjugal life happy.

Red Coral: This gemstone controls the aggressive behaviour of individual. It may protect from accidents, injuries, and wounds. It has good effects on control of menstrual disorders, reduces the chance of miscarriage and promotes safe delivery.

Emerald gemstone increases brainpower, intelligence, reasoning ability, communication skill, and speech power. It reduces passion and sexual desire. It can be used to control trouble related to asthma, skin, and bronchitis.

Yellow Sapphire gemstone controls the functioning of liver, jaundice, anemia, blood pressure, gastric trouble and fever.

Diamond has good effects on the private parts and sex organs. It cures sexual weakness, kidney trouble and diabetes.

Blue Sapphire has positive effect on nervous and joint disorders and controls gastric trouble, gout, arthritis, heart trouble, asthma, and legs pain. It increases stamina. It improves the fertility of barren women.

Hessonite (Gomed) gemstone controls indigestion, skin disease, insomnia, hysteria, snake bite, dog-bite, blood poisoning. It also controls undiagnosed diseases.

Cats Eye: Gemstone is very hot in nature and cure paralysis, mania, blood poisoning, malignant diseases and undiagnosed or, occult diseases.

Our body is composed of seven primary colours of the solar spectrum: violet, indigo, blue, green, yellow and red. These are called primary colors and mixing one or two primary colors makes other hues and shades. When there is deficiency or absence of any one of these primary colors in our body, we are attacked with the disease caused by that deficiency.

Gems have been used from time s immemorial to cure certain diseases. Gemstones like coral have been found to be very useful in curing diseases rapidly like anaemia, general disability, skin disorder, blemishes, etc.

Blue Sapphire has also been found to be effective in diseases like vomiting, nausea, headaches etc. Lapiz Lazuli has been tried and tested and is very useful for those, who may tend to be lazy and lethargic but are desirous of increasing their image in social and business circle. It can also ward off ailments connected with liver and stomach pretty fast.

For mental depression, pearl or moonstone is recommended, but those who can afford to spend more can go in for a pearl in silver in combination with a white sapphire to be worn in the ring finger, in the right hand in the case of males and left hand in the case of females. In case of diabetes, the use of white coral and white sapphire is recommended. For **high blood pressure**, use of garnet, ruby and blue sapphire but in case of elderly ladies suffering from blood pressure and heart problems, ruby, emerald and pearl together in silver can also be effective but these should be worn only after obtaining expert guidance. Gems are also very effective as Astrological Remedies. ⁴

Procedure to get an Astrosmile:⁵

Forget the early trends which our ancestors, use to wear their birthstones, it's the time for a revolution in three easy steps (Figure.2):

1. Check out for your birth stone : The first step to get an *Astrosmile* is to know which stone one should wear; patients can do this by two ways:

Consult with astrologer

Internet zodiac stone suggestion charts (Figure 3)
Selection of these birthstones can be on the basis of patients' zodiac sign or the effecting planets in their zodiac and the stone can also be selected on the basis of the ayurvedic recommendation for the cure of a particular diseases mentioned before in the article. But one should be concerned about the contradicted stone for an individual in his/her zodiac, as it may cause otherwise effects.

2. Consult your dentist : After the selection of the birthstone the second step is to consult your dentist. The dentist should evaluate the patients on the basis of his/her oral hygiene and malformations of tooth structures. The tooth jewellery should not be given in patients with poor oral hygiene, attrition, bruxism, malformed teeth and several other conditions as it may lead to caries progression and plaque accumulation and may get accidentally swallowed by the patient in case of bruxism.

3. Get a lucky charm in your smile (Astrosmile): When the patient is satisfied with the selection of his birthstone and the dentist is satisfied with patient's oral hygiene part, the next step is to fix the birthstone on his/her tooth enamel.

Procedure:

The tooth is cleaned with a fluoride-free polishing paste. Completely dry and isolate the tooth. Tooth is etched with 37% orthophosphoric acid for about 20-30 sec to increase the surface area for bonding. Rinse surface thoroughly with water and blow dry for 10 sec. Apply a light-curing bonding agent. Leave it on for a maximum of 20 seconds, distribute bonding agent through air blowing. Then light-cure for 20 sec. Apply a small amount of flow composite to the surface of the tooth. Use a jewel handler to easily pick up the jewel. Press it into the centre of the composite. (The composite must ooze on the sides so it is encircled by the composite, ensuring macro mechanical retention, but make certain the jewel is in contact with the enamel.) Now you may adjust the jewel while letting the patient check the desired positioning in the mirror. Take the light-curing lamp and start curing the composite from the top for about 60 seconds. Light cure from the sides for a few seconds and also cure the composite from the back of the tooth for another 60 seconds making sure the composite hardens evenly. Total curing time is approximately 180 seconds. (Follow instructions of the bonding-system you are using) The total time for jewel to set into the composite is 20 sec. Do not touch the jewel with your fingers once it's removed from the case. To guarantee maximum adhesiveness, it is essential to avoid skin contact with the special

coating on the backside of the jewel. It takes about 4 minutes to safely affix the jewel. The enamel is treated with topical fluoride to remineralize the etched area.^{5,6}

Removal of the tooth jewel:⁷

The jewel is removed in the same way as an orthodontic bracket and the enamel will not be harmed. After removal of the gem, the tooth needs to be polished, which takes away any remaining bonding materials. Use a scaler or a rubber polisher when removing the stone. In case of leftover bonding or composite on the tooth, it has to be removed by using a polishing tool. It is recommended to treat the tooth with fluoride, so remineralization and stabilization of the enamel is provided.

Advantages of Birthstones

The birth stones don't require any preparation of teeth and loss of tooth structure is negligible. Most importantly the procedure is non-invasive and in case not needed, this can be removed easily.

Use of birthstones as a tooth jewellery is more logical, conservative and non harmful over oral piercings as the piercing has following harmful effects:^{6,8,9}

- Airway compromise
- Allergic reaction to metal
- Bleeding and risk of haemorrhage
- Galvanism
- Gingival recession
- Hyperplastic and scar tissue formation
- Increased salivary flow
- Inhalation of the jewellery
- Interference with radiographic images
- Interference with speech, chewing and swallowing
- Localized and systemic infections
- Nerve damage and paraesthesia
- Pain
- Swelling
- Tooth fracture or chipping

Limitations:

- It may lead to plaque accumulation
- It may lead to caries progression
- May get accidentally swallowed by the patient
- Cannot bear much stress

Precautions:^{10, 11}

It is important to maintain proper oral hygiene and gentle brushing is must to preserve the caries formation around the birthstone used as tooth jewel. Patient is instructed not to put excessive stress on the jewel.

Conclusions:

Tooth jewellery is believed to enhance appearance and, by doing so, improve the patient's self esteem and self confidence. Tooth jewellery should be advised only in patients with good oral hygiene maintenance. Dental practitioners should discuss with patients the potential risks of oral piercings and jewellery, as well as recommendations for hygiene and management of existing piercings to help reduce damaging effects. Useful information includes the recognition and management of oral and systemic side effects and the use of appropriate materials and adhesives for tooth jewellery.

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Figure: 1



Figure 2



Figure 3



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