Dental Follicle

The E- Journal Of Dentistry

ISSN 2230-9489 (e) | Dr. Syed Nabeel

Dentistry United.com
Complete Dentistry Information

Contents

Scientific Editorial - Combined Endodontic-Periodontic-Orthodontic- interdisciplinary treatment approach in a periodontally compromised maxillary central incisor - A Case Presentation

Dr.Syed Nabeel | Editor in Chief Dental Follicle - The E Journal of Dentistry | Founder and CEO DentistryUnited.com | Director: Smile Maker Clinics Pvt. Ltd INDIA

Abstract:

A multidisciplinary approach in cases involving endo-perio lesions is a key to successful treatment. In this case report a combined orthodontic , periodontal and endodonitc treatment has been employed to save a maxillary right central incisor ,thereby preserving the tooth without any coronoplasty or extraction .

Mesh Keywords: Alveolar Bone Loss, Combined perio-ortho, interdisciplinary,

Introduction

A 30 year male patient reported with tooth number 8 extrusion and mobility. On examination the tooth was found to be grade 2 mobile , extruded by 2 mm and gingival recession . There was no history of trauma. Radiograph revealed sever alveolar bone loss .

A conservative approach was chosen after discussion with the patient. Endodonitc treatment was initiated followed immediately by scaling and root planing of the entire sextant. The teeth from canine to canine were bonded with Roth .022 PEA brackets and an .012 NiTi wire was engaged. After one month a stainless steel round .014 wire replaced the previous wire and subsequently an .017 X .025 rectangular stainless steel wire .At the end of three months substantial bone growth was achieved radiographically and clinically the tooth achieved the required intrusion. There was a remarkable reduction in the recession palatally.It has been suggested that Orthodontic stimulation increases the turnover of the periodontal ligament cells and enhances the possibility of their repopulating the root surface.[2]

An intrusive tooth movement may promote new attachment formation and seems to be a more effective and biologically conservative means to realign extruded tooth following periodontal therapy has been suggested by Melsen et al.[4]

Fig 1 :Pre - Op Extruded tooth number 8

Fig 2 :Note the palatal Bleeding , indicating a periodontal lesion

Fig 3 :The Mirror Image of the tooth , post operative third day after scaling and root **planning**.,

Fig 4 :The Pre-Op Radiograph showing the severe loss of bone .

Fig 5 :The loss of bone and the lesion in the bone after the Endodonitc treatment

Fig 6 :The .022 Roth PEA Brackets with .012 NiTi Wire

Fig 7 :The Teeth on a rectangular .017 X .025 wire in the third month of Orthodontic treatment

Fig 8 :Note the increase in bone height and density

Fig 9 and 10: After removal of the Braces

Fig 11: Post Operative Radiograph showing the healing in the peri-apical area.

Fig 12: Smile Before

Fig 13: Smile After

Results:

With combined Endodonitc , periodontal and orthodontic treatment , satisfactory intrusion of the maxillary right central incisor was achieved. There was also remarkable bone regeneration.

Conclusion:

Multidisciplinary approach in teeth affected by perio-endo lesions is the key to saving the extraction of the tooth. A combined orthodontic-periodontal approach can help modify the height of the papillae, an essential contribution to esthetic dentistry.[3]

References:

1.Laurell L, Gottlow J, Zybutz M, Persson R. Treatment of infrabony defects by different surgical procedures. A literature review. J Periodontol. 1998;69:303–13. [PubMed]

2. Corrente G, Abundo R, Cardaropoli D, Cardaropoli G. Orthodontic movement into infrabony defects in patients with advanced periodontal disease: A clinical and radiological study. J Periodontol. 2003;74:1104–09. [PubMed]

3. Cardaropoli D, Re S, Corrente G, Abundo R. Reconstruction of the maxillary midline papilla following a combined orthodonticperiodontic treatment in adult periodontal patients. J Clin Periodontol. 2004;31:79–84. [PubMed]

4.Melsen B, Agerbaek N, Eriksen J, Terp S. New attachment through periodontal treatment and orthodontic intrusion. Am J Orthod Dentofacial Orthop. 1988;94:104–16. [PubMed]

Submental Orotracheal Intubation , An Effective Technique In Maxillofacial Trauma – A Technical Note

Dr. S. Devakumari |M.D.S |Assistant Professor |Dentistry Indira Gandhi Medical College & Research Institute |Govt. of Puducherry Institution | Kathirkamam, Puducherry |
Dr. I. Joseph Raajesh |M.D.|Associate Professor |Anesthesiology |Indira Gandhi Medical College & Research Institute |Govt. of Puducherry Institution |Kathirkamam, Puducherry.

Abstract:

Objective: To highlight submental orotracheal intubation (SMI) as a simple, effective and versatile technique which provides an unhindered operating field in panfacial injuries with very low morbidity when compared to tracheostomy. SMI gives access to fronto nasal regions as well as intraoral region with the ease of checking and maintaining occlusion during surgery. It is a reliable and superior alternative technique to tracheostomy. This paper is designed to detail the procedure of SMI, its indications, contraindications, advantages, disadvantages and its complications too.

Materials and methods – Intubation and securing airway for providing anaesthesia in complex maxillofacial trauma involving nasal bone and naso orbitalethmoid region (NOE) is a challenging task. It always necessitates discussion between anesthesiologist and the surgeon.

A patient in whom sub mental intubation is planned, first routine orotracheal intubation is done. Then an incision is placed in the paramedian aspect of the submental region to create a tunnel for the endotracheal tube (ET) to pass through the floor of the mouth in oral cavity to the submental region.

Case reports: Seven patients of maxillofacial trauma victims with severe nasoorbital ethmoid injury were selected for submental intubation for performing ORIF under GA.In these patients if submental intubation was not planned then they would have undergone tracheostomy as a next available option.

Results: With careful adherence to the SMI technique and precautions the complications are very minimal when compared to tracheostomy. SMI can be considered as a reliable alternative to tracheostomy in complex maxillofacial trauma.

Conclusion: SMI is a time tested procedure for more than 20yrs. SMI codifies a simple, reproducible technique which demands little surgical skill and needs only standard instruments. So SMI is a well appreciated procedure which can be readily incorporated in the surgical practice of maxillofacial trauma management.

Mesh Key-words: Nasoethmoidal injury,Intubation,submental intubation,maxillofacial surgery, tracheostomy.

Introduction:

Submental orotracheal intubation (SMI) can be considered as a method of choice for complex maxillofacial trauma with fractures in nasal, frontal and NOE regions. Nasal intubation in these patients is difficult due to the presence of fractures or may be contra-indicated for reasons of accidental intracranial tube passage and sepsis. Orotracheal intubation is least preferred in these situations, since it interferes with occlusion. When both nasal and orotracheal intubation are difficult and not the choice of maintaining the airway, tracheostomy was considered as alternative technique till recent past. With its simplicity and effectiveness, SMI is a versatile technique which can obviate the need for tracheosotmy and its complications in panfacial trauma.

Materials and methods:

In our institute from the year 2007 to 2011, SMI was performed in seven patients with Pan facial injury. Informed consent was obtained in all the patients after explaining the technique in detail, including anticipated complications. Though mouth opening is possible in all patients, it could admit only two fingers .According to Mallampatti classification all of them were falling between grade II- III

All Patients were prepared and approached as having difficult airway according to the protocol. All patients received Premedication with Inj. Glycopyrollate and Ondansetron. Patients were preoxygenated for 3minutes and anesthesia was induced with Inj. Propofol 100 - 150 mg and pethidine/ fentanyl/Morphine for analgesia. Muscle relaxation was obtained with 100mg of suxamethonium chloride. Flexometallic tubes are preferred type of endotracheal tubes for SMI as they are reinforced with springs inside. They are also flexible, kink resistant and maintain patency even in acute bends as in the floor of the mouth to the submental region.

Technique:

Initially an orotracheal intubation is performed by conventional method which will be then converted into SMI. An important step before intubating the patient orotracheally with flexometallic tube is to confirm the feasibility of removing the adaptor in the machine end. Under strict aseptic surgical protocol, 2cm long incision was placed in the submental region slightly in the paramedian aspect to the lower border of the mandible (Figure 1 & 2). A kelly's haemostat is bluntly introduced to pass through skin, subcutaneous tissue, platysma, deep cervical fascia, mylohyoid to reach the oral mucous membrane (Figure 3). An incision is placed in the distal end of the forceps in front of the sublingual caruncle. Care

should be taken to place the artery forceps in close proximity to lingual cortex of the mandible in the supra periosteal plane (Figure 4). The forceps is opened to widen the tunnel for the ET tube to pass through.

Figure 1 : 2 cm long incision marked in the paramedian aspect of the right mandible

Figure 2 : Incision

Figure 3: Tunnelling Procedure in the submental region

Complete hemostasis should be obtained at the incision site intra orally and thorough suction should be done to make the floor of the mouth free of blood and clots. This is to avoid the entry of blood or clots into the tube while manipulating the tube through the submental incision.

A two step procedure is followed after this for the conversion of orotracheal intubation to SMI. The proximal connector of ET tube should be loose enough to be easily detached and yet should be tight enough not to allow ET tube to leak. It is important to ventilate the patient with 100% oxygen for 3min to prevent oxygen desaturation during subsequent disconnection.

The pilot balloon was first grasped and brought in to submental route (Figure 5) followed by the distal end of the ET tube after the detachment of the connector . Care should be taken to hold the ET tube with magills forceps if needed at its tracheal end while orotracheal intubation is transferred into SMI (Figure 6). The ET tube in the submental region is re fixed with proximal connector and connected to the anesthesia circuit (Figure 7).

Figure 4;Hoemostat in the Oral cavity after tunneling

Figure 5: Pilot baloon retrieved from oral cavity to submental region

Figure 6: ET tube in the oral cavity after SMI

Figure 7: ET tube in the submental region connected to the circuit

It is mandatory to check for airway patency after the tube is passed in to submental route both clinically and with end tidal CO2 waved forms. The ET tube is then secured with stay sutures in the submental region. Once both surgeon and anesthesiologists are convinced about the position and placement, the surgical procedure can be started.

During extubation distal end of ET tube was brought back again in to oral cavity followed by the ET tube cuff and Orotracheal intubation is maintained till extubation criteria are met. The skin incision was closed by interrupted sutures with 3/0 silk and intra oral wound was allowed to heal secondarily. RESULTS Ultrasonic endodontic tips have proved their utility in eliminating obstructed intra-canal obstructions like separated files and can be extremely effective when used with the aid of an operating microscope.

Results:

Management of airway in panfacial injuries along with fractures of naso orbital ethmoid and nasal bone is a great task. The Submental intubation technique is an effective, simple and versatile technique which replaced tracheostomy when both oral and nasal intubation are not possible. The technique provides ease and convenience for surgery in fronto nasal region, intraoral region and most importantly there is absolutely no interference in achieving occlusion even though the tube remains inside the mouth during the procedure. So submental intubtion can be adopted in complex maxillofacial trauma patients without severe neurological damage and in patients where prolonged ventilator support is not warranted.

Discussion

Management of airway in complex maxillofacial trauma involving nasal, Frontal regions always necessitates interaction between the surgeons and anesthesiologists for airway management.

Nasal intubation is contraindicated in pan-facial injuries to avoid risk of accidental passage of ET tube through the fracture skull base, dislodgement of bony fragment into cranial cavity, sepsis and to prevent iatrogenic CSF leakage. Further, even in normal individuals without fracture, the presence of deviated nasal septum and intra nasal pathologies precludes the use of nasal route for intubation [1, 2]

The primary goal of any maxillofacial trauma surgery is the achievement of premorbid occlusion. Orotracheal intubation is undesirable to achieve this gold standard goal. When orotracheal and naso tracheal intubations are contraindicated tracheostomy was traditionally followed for years.Retromolar intubation [3] can be considered as a choice when retromolar space is adequate. In this technique the tube is positioned in the retromolar space after oral intubation and then it is fixed to the arch bar. However presence of tube in the oral cavity interferes with the surgical field especially in comminuted fracture of mandible. Accidental extubation or displacement is a possibility during manipulation of the fractured bone.Kim et al[4] mentioned retromolar tube as a disturbance.

Tracheosotomy has its own complications like haemorrhage, subcutaneos emphysema, tube blockage, tracheitis, tracheo esophageal fistula, cellulitis, tracheal stenosis and recurrent laryngeal nerve damage[5,6,7].Also tracheostomy demands meticulous surgical and post operative management where as submental intubation is simple, easy to learn procedure and requires only routine surgical instruments. It is a well appreciated procedure for more than twenty years.

Alteimer [8] in 1986 proposed this alternative submental route for orotracheal intubation. Since the introduction, this procedure had undergone only subtle modifications. SMI is now a well known alternative technique to tracheostomy in complex maxillofacial trauma. Schutz and Hamed[9] in their comparative study between tracheostomy and SMI found that SMI is associated with less complication than tracheosotomy.

Several modifications were proposed for SMI surgical technique. Stoll et al [10] proposed a submandibular approach. Mc Innis and Baig [11] preferred a midline approach rather than lateral submental approach because of difficulty in tube passage, bleeding and submental gland injury. Sharma et al 12 claimed that by proceeding in the midline, the surgical field is avascular inbetween the two bellies of mylohyoid and anterior belly of digastric.

However midline incision has the risk of damaging Wharton's duct and damages attachment of geniohyoid muscle. Caubi et al [13]proposed the SMI in the paramedian aspect of the submental region of the mandible.The incision in the paramedian aspect of the mandible was preferred because there only few anatomic structures present in this region. Tagialatela et al [14] proposed maintanence of artery forceps in the supropeiostal plane in close contact with lingual cortex of mandible to prevent neuro vascular damage.This is a very well appreciated modification and it is routinely followed. Gadre and wakins [15] confirm the same observation. Stanc and skorachi [16] observed the mucocele formation is more

when tube was passed from intra oral to sub mental region. This is because of incorporation of mucosal remnants in the surgical tunnel produced for SMI.

The technique of SMI underwent refinement after many alteration in intubation techniques too.

Werther et al [17] proposed a ET tube exchange technique from nasal route to oral route without extubation. It needs special skills to intubate in the presence of nasal bone fractures. After operating on the oral region during the nasal reconstruction the nasal route is transformed in to oral route. It is time consuming and it is difficult to maintain the tube.

Green and moore[18] first secured the airway by orotracheal intubation and then replaced it with an armored tube passed from exterior to interior through the submental route replacing the oral tube.This technique necessitates the use of magills forceps for maneuvering the tube into trachea . In this pocess there is a possibility of cuff damage as described by MAK P.H.[19] Altemir and Montero[20] used a laryngeal mask in patients with laryngeal trauma, unstable cervical fracture and in voice professionals. Drolet et al[21] proposed a lubricated tube exchanger to replace a submental tracheal tube with a armoured tube.He suggested the technique works well when the ET tube is damaged. Lim et al[22] suggested covering of the proximal end of ET tube with a blue cap of thoracic catheter to prevent entrapment of blood clot and soft tissue in to the tube while traveling from oral route to submental route.

Amin et al[23] used a 100% silicone wire – reinforced tube with a removable connector, which was designed to use with laryngeal mask airway. He used capnagraphy to check the tube position during SMI and through out the surgery. He confirmed that there was no appreciable change during the procedure. Arya et al[24] used a pharyngeal loop assembly for retrograde SMI in patients with limited mouth opening.

There are other indications for SMI as well. Nyrandy[25] and chandu[26] used SMI for simultaneous orthognatic surgery and Rhinoplasty. Bigiloli[27] utilized SMI technique for trans maxillary approaches to reach the skull base. Downward retraction of maxilla to reach the skull base was not a problem with SMI.

In our case series of seven patients of complex maxillofacial trauma, we prefered to use a flexometallic ET tube (single use Ramsons Reinforced 7 , 7.5 mm in diameter)and paramedian approach in the submental region. The technique was very comfortable for nasal reconstruction, management of NOE fractures along with the open reduction and internal fixation techniques in maxilla, Zygoma and mandible. The procedure permitted inter maxillary fixation during fracture reduction and fixation. The maximum time consumed was not more than 7 mins.

The only complication that was encountered in our case series was superficial skin infection after 2 weeks in one patient and after one month in another patient, both of them were managed by superficial debridement, suturing and antibiotics.

Other complications such as mucocele, salivary fistula, damage to ET tube cuff, damage to pilot balloon and abscess in the floor of the mouth as mentioned in the literature were not encountered in our patients.

Conclusion

Maxillofacial and plastic surgeries especially Rhinoplasty are shared airway surgeries. They pose a serious threat of limited airway options.SMI is a time tested procedure for more than 20yrs with minimum morbidity.

On close observation with patterns of maxillofacial injuries in trauma centers in India12, it can be learnt that not all cases of maxillofacial trauma requires SMI. In our centre the number of maxillofacial trauma victims were 240 in 4yrs. Out of these 240 patients only seven patients required SMI.

The limitations of this technique are it is contra indicated in patients with severe neurologic damage, major thoracic trauma and in patients who needs repeated surgical interventions. These patients may require prolonged assisted ventilation. So tracheostomy is considered safer than SMI.

Though the surgical and anaesthetic teams are not exposed to this in day to day practice, SMI can still be considered as safe and better alternative to tracheostomy in this complex maxillo facial trauma with limited airway options without any hesitation.

References:

1. Muzzi DM,Losasso TJ, Cucchiara RF. Complications from a nasopharyngeal airway in a patient with a basilar skull fractures. Anesthesiology 1991;74:366-72.
2. Marlow TJ, Goltra DD, Schabel SI. Intracranical placement of a nasotracheal tube after facial fracture: A rare complication. J Emerg Med 1997;5:187-91.
3. Neena Rungta M.D, Indian.J.Trauma. Anaesth.crit care
Vol.8No.1.2007;573- 575.
4. Kim KF, Doriot R, Morse MA, et al Alternative to tracheostomy: Sub mental intubation in Cranio Maxillo Facial trauma.J.Craniofac surg 2005:16(3):498-500.
5. Chew JY, Cantrell RW. Tracheostomy, complications and their management. Arch Otolaryngol 1972;965:38-45.
6. Walker DG. Complications of tracheostomy: Their prevention and treatment. J Oral Surg 1973;31:480-2.
7. Wood DE. Tracheostomy. Chest Surg Clin N Am 1996;6:749.
8. Altemir FH. The sub mental route for endotracheal intubation. J Maxillofac Surg 1986;14:64-5.
9. Schutz P, Hamed HH. Submental intubation versus tracheostomy in maxillofacial trauma patients. J Oral Maxillofac Surg 2008;66:1404-9.
10. Stoll P, Galli C, Wachter R, Bahr W. Submandibular endotracheal intubation in panfacial fractures. J Clin Anesth 1994;6:83-6.
11. MacInnis E, Baig M. A modified submental approach for oral endotracheal intubation. Int J Oral Maxillofac Surg 1999;28:344-6.
12. Sharma RK, Tulip, Cyriac C, Parashar A, Makkar S. Submental tracheal intubation in craniomaxillofacial surgery. Indian J Plast surg 2008;41:15-19.
13. Caubi AF, Vasconcelos BCE, Vasconcelos RJH, Morais HHAM Rocha NS (2008) Submental intubation in oral maxillofacial surgery: review of literature and analysis of 13 cases. Med Oral Patol Oral Cir Bucal 13(3):E197-E200.
14. Taglialatela S, Maio G, Alibert F.Submento-submandibular intubation: Is the subperiosteal passage essential? Experience in 107 consecutive cases. Br J Maxillofac Surg 2006;44:12-4.
15. Gadre KS, Waknis PP. Transmylohyoid/Submental Intubation: Review, Analysis, and Refinements.J Craniomaxillofac Surg 2010;21:516-9.

16. Stranc MF, Skoracki R. A complication of submandibular intubation in a panfacial fracture patient. J Oral Maxillofac Surg 2001;29:174-6.
17. Werther JR, Richardson Mcllwain MR.Nasal tube switch:converting from nasal to oral endotracheal tube without extubation. J oral maxillofac surg 1994:52;994-6.
18. Green JD, Moore UJ (1996) A modification of submental intubation. Br J Anaesth 77(6):789-791.
19. Mak PH, Ooi R G, submental intubation in a patient with beta thalassaemia major undergoing elective maxillary & mandibular osteotomies. Br.J Anaesth, 2002 Feb;88(2): 288-91.
20. Altemir FH, Montero SH. The submental route revisited using the laryngeal mask airway: A technical note.J Craniomaxillofac Surg 2000;28:343-4.
21.Drolet P, Girard M, Poirier J, Grenier Y. Facilitating submental endotracheal intubation with an endotracheal tube exchanger. Anesth Analg 2000;90:222-3
22. Lim HK, Kim IK, Han JU. Modified submental orotracheal intubation using the blue cap on the end of the thoracic catheter. Yonsei Med J 2003;44:99-22.
23. Amin M, Dill-Russell P, Manisali M, Lee R, Sinton I. Facial fractures and submental tracheal intubation. Anaesthesia 2002;57:1195-9.
24. Arya VK, Kumar A, Makkar SS. Retrograde submental intubation by pharyngeal loop technique in a patient with faciomaxillary trauma and restricted mouth opening. Anesth Analg 2005;100:534-7.
25. Nyarady Z, Sari F, Olasz L, Nyarady J. Submental endotracheal intubation in concurrent orthognatic surgery: A technical note.JCraniomaxillofac Surg 2006;34:362-5.
26. Chandu A, Witherow H, Stewart A. Submental intubation in orthognathic surgery: Initial experience. Br J Oral Maxillofac Surg 2008;46:561-3.
27. Biglioli F, Mortini P, Goisis M. Submental orotracheal intubation: An alternative to tracheostomy in transfacial cranial base surgery. Skull Base Surg 2003;13:189-95.

Titanium implant material- it's properties and suitability as the implant material of choice

Dr. Sanjay Jamdade |Dr. S.D.Jamdade Dental Clinic |Boisar |INDIA

Abstract

Objective - The article aims to explore and establish the reasons for the use of Titanium as an implant material of choice in dental applications as a tooth replacement alternative

Materials and methods - Titanium dental implant, Porcelain fused to non precious Metal

Results – Osseointegration of Dental Implant into the patient's mandible

Conclusion - Titanium is suitable as a dental implant material

Mesh Keywords: - Titanium Dental Implant material, Dental Implant, Dentsply Xive Implant, Indirect Sinus Lift, Osseointegration

Introduction

In the decade of the fifties during research on bone healing and regeneration, titanium chambers implanted into rabbit's bones got integrated into them and could not be removed. This led to the discovery of titanium as a biologically well tolerated and well accepted metal by Dr Per Ingmar Branemark, the then young researcher. Since then many other materials like Titanium alloy, cobalt chromium alloy, austenitic Fe-Cr-Ni-Mo steels, tantalum, niobium and zirconium alloys, precious metals like Gold, platinum, silver, later iridium, hafnium, palladium, tungsten, ceramics and polymeric materials have been used or experimented with for various procedures.[1]

Titanium is a metal which is found in abundance in nature, it is the 4th most abundant metal after iron, magnesium, aluminium. It is the 9th most abundant metal found in the earth crust. It is as strong as steel but is 45% lighter. It has a very high melting temperature 16680 C. It burns only in the presence of Air or Nitrogen. It has an excellent corrosion resistance.[1]

It is the excellent corrosion resistance of Titanium which makes it tremendously bio inert.[1, 3]

Placing Titanium inside bone led to a close adaptation of newly growing bone on the implant surface. This process was termed as

"Osseointegration" by Professor Branemark. In his paper Prof Albrektsson and Professor Branemark et al have stated that collagen fibres attached to bone in a manner identical to the way Sharpey's fibres attach to bone without any intersped connective tissue.[4]Factors influencing successful osseointegration or to failure have been outlined by Professor Branemark in the 1969 " Intra- Osseous Anchorage of Dental Prosthesis"[7] paper and Tomas Albrekston et al in their paper " Osseointegraion of bone implants"[4] in 1981. The Soft tissue like gingiva got attached to the titanium much in a manner similar to the way junctional epithelium got attached to tooth surface via hemi-desmosal attachment.[6,8]

Earliest Titanium implants were made of pure titanium. It is believed that pure titanium optimized osteoblastic differentiation much more than did Ti alloy. In the long term commercially pure Titanium implants were more stable and showed slightly better Bone Implant contact (BIC) as well as better Removal torque (RT). Titanium alloy scored over commercially pure titanium due to the superior mechanical properties. Pure titanium lower modulus of elasticity as compared to Titanium alloy. The tensile strength was also lower than Titanium alloy. As a result titanium implants and titanium components of implants risked fractures. With the use of titanium alloy in implantology the risk of implant and implant component abrasion, distortion and fracture is reduced.

Titanium Alloy is made up of the following[2, 8]

Ti6Al4V – Titanium Alloy of (titanium- 6 aluminum - 4 vanadium) contains[2]

- 90% Titanium,
- 6% Aluminum - decreases specific weight and improves elastic modulus[2]
- 4% Vanadium - decreases thermal conductivity and increases hardness [2]

An alloy is a mixture of metals so the component metals retain their original element status inside the alloy. So the metals are present as a mosaic inside the alloy metal. Bone cells are selective about the titanium and attach themselves selectively only to the Titanium avoiding Aluminium and vanadium. This affects the BIC values, RT values. However the better physical properties encourage manufacturers to use Titanium alloys. In the longer run the BIC and RT values of both CPTI and Ti Alloy become nearly the same. This can be explained by the fact that both materials when exposed to air form TiO_2 all over the implant surface. When an implant is inserted in the bone it is this TiO_2 which comes in contact with the bone[8]. It is this

TiO_2 which plays 3 roles it has corrosion resistance, biocompatibility and osseointegration basically takes place with this 2-5nm thickness layer. This TiO_2 being common to both implant materials may be the reason why implant integration values post operatively don't show statistically significant values and practically does not spoil the overall osseo integration statistics.[2]

TiO_2 can be influenced by the way the implant surface is treated and stored. A very thin layer of TiO_2 is what is useful, an excessively thick TiO_2 [2]

Dental Implants are now manufactured with coatings and surface treatments that enhance the process of osseointegration[2, 8]

Case Reports-

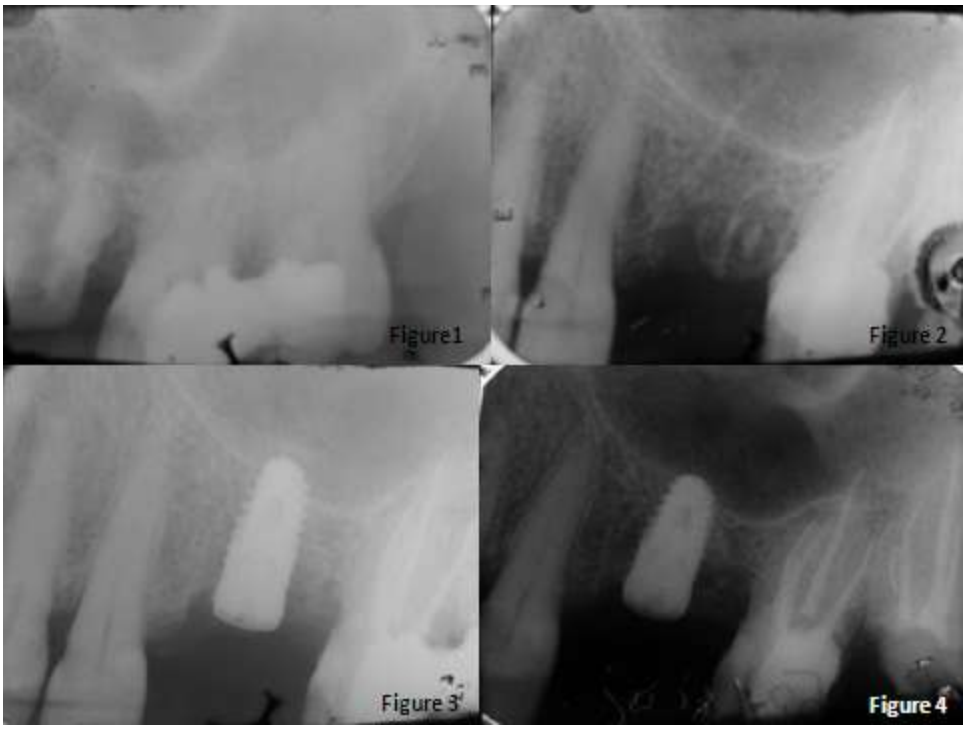
An elderly male patient complained about inability to chew from the left side. Examination revealed he had a broken root piece of upper left second molar tooth left. Figure 1 The 26 tooth had been previously endodontically treated. The two teeth behind were badly carious. He was explained the treatment plan which was that we would need to extract 26 tooth and place an implant, do endodontic treatment of 27 tooth and extract 28 tooth. He did not agree to extract 28 tooth. So it was planned to save 28 for the interim period of implantation.

Tooth no 27 and 26 were endodontically treated. Unfortunately 28 developed a instrument separation which was explained to the patient. On the day of surgery 26 extraction and immediate implantation were planned. Accordingly aseptic protocol and isolation were followed. The patient was given Local infiltration of Articaine 2cc and the tooth was extracted with 15 no blade and periotomes and mallets after sectioning the tooth into 3 parts.

The wound was curetted with long shank excavators and it was planned to place the implant in the palatal socket of the edentulous zone. It was noted that the socket depth was around 8 to 9 mm. That was insufficient for a dental implant of 9.5 mm. So it was decided to do an indirect sinus lift before placing an 9.5 length implant.

Accordingly the palatal socket was sequentially prepared to a diameter of 4.5 mm diameter and 8.5 mm length using the Dentsply Xive Surgical kit. After that a condensing osteotome was used sequentially from a small size to a larger size and finally 4.2 size osteotome was used to tap through the sinus floor. After that at the mouth of the osteotomy a bone tap of 4.5 size was used. The site was irrigated

with saline. Then a 4.5/9.5mm Dentsply Xive implant was placed initially using a motor and finally ratcheted into place with an Implant ratchet. The cover screw was screwed into place and the buccal and palatal flap's were sutured with 4.0 vicryl sutures. On the 8 the post operative day the sutures were removed. The patient had no post operative complaints whatsoever. Figure 3. The implant was followed in the interim period. Figure 4.



The implant was restored 7 months later. The restoration was fabricated by taking direct impression of the prepared abutment. Figure 5 and 6.

In the interim period 28 was extracted. Patient did not come for the 27 crown. There is root caries in the 27 and periapical lesion in relation to 25. Figure 6. However the implant seems to be doing well. A 3 ½ year follow up X ray was taken recently. The crestal bone levels are stable and are in fact better than the immediate post operative levels. Figure 7.

Figure 5, 6, 7

Case 2

A patient reported with recently lost bridge. The mesial pontic was the second premolar the distal pontic was an tilted wisdom molar. It was planned to endodontically treat the premolar and then extract the wisdom molar and then implant two titanium Ez Hitec implants in the first and second molar region.

Accordingly the wisdom molar was extracted under local anaesthesia and the 2 implants installed. Six months post operative view shows that the implants have integrated and the crestal bone levels were maintained. And there was no evidence of any osteolysis or any soft tissue reaction. The implants were then restored prosthodontically.

Results-

The titanium Endosseous screw implant was well accepted by the patient's tissues and the patient could put it into function after restoration. There is no crestal bone loss or any clinical signs of infection or inflammation. Osseointegration of the dental implants into the patient's jaws took place.

Discussion-

Rejection of any implanted material placed in bone is followed by osteolytic changes in the receiving bone and abscess around the implanted materials. No such adverse tissue reaction was seen at all. In fact the patient were able to chew very well with the dental implants in place and had no complaints what so ever, neither was there any pain in the short or long term.

Conclusion –

That titanium is a suitable dental implant material has been clearly proved here in the cases presented here. It will be a while before other alternative materials like zirconia etc. to prove that they are equally good.

References

1. Carl E. Misch “Biomaterials for implants “ 3Rd edition of textbook “Contemporary implant dentistry”

2. Carl E. Misch “Dental Implant Surfaces” 3 Rd edition of textbook “Contemporary implant dentistry”

3. Van Noort, R. "Titanium: the implant material of today." Journal of Materials Science 22.11 (1987): 3801-3811.

4. T. Albrektsson , P.-I. Brånemark, H.-A. Hansson and J. Lindström, “Osseointegrated Titanium Implants: Requirements for Ensuring a Long-Lasting, Direct Bone-to-Implant Anchorage in Man” 1981, Vol. 52, No. 2 , Pages 155-170

5. Tomas Albrektsson and Bjorn Albrektsson “Osseointegration of bone implants: A review of an alternative mode of fixation” Acta Orthop. Scand. 58, 567-577, 1987

6. T. R. L. Gould, D. M. Brunette, L. Westsury “The attachment mechanism of epithelial cells to titanium in vitro” Journal of Periodontal Research Volume 16, Issue 6, pages 611–616, December 1981

7. P.-I. Brånemark, U. Breine, R. Adell, B. O. Hansson, J. Lindström and Å. Ohlsson “Intra-Osseous Anchorage of Dental Prostheses”: . Experimental Studies 1969, Vol. 3, No. 2 , Pages 81-100

8. J. C. Wataha “Materials for endosseous dental implants” Journal of Oral Rehabilitation Volume 23, Issue 2, pages 79–90, February 1996