



ISSN: 0976-3031

Available Online at <http://www.recentscientific.com>

CODEN: IJRSFP (USA)

International Journal of Recent Scientific Research
Vol. 10, Issue, 04(B), pp. 31763-31766, April, 2019

**International Journal of
Recent Scientific
Research**

DOI: 10.24327/IJRSR

Research Article

TREATMENT OF CHRONIC OSTEOMYELITIS OF MANDIBLE WITH VANCOMYCIN IMPREGNATED POLYMETHAMETHACRYLATE BEADS AND RECORDING EARLY BONE CHANGES: A CASE REPORT

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DOI: <http://dx.doi.org/10.24327/ijrsr.2019.1004.3331>

ARTICLE INFO

Article History:

Received 15th January, 2019
Received in revised form 7th
February, 2019
Accepted 13th March, 2019
Published online 28th April, 2019

ABSTRACT

An elderly female patient presented with non healing extracted tooth socket, pain and intra oral diffuse swelling with 36, 37 regions since one year. Based on clinical, radiographic features and histopathology report diagnosis of chronic osteomyelitis was made. Patient was started with intra-venous antimicrobial antibiotics. Sequestrectomy, decortication were done followed by placement of vancomycin impregnated polymethamethacrylate (PMMA) beads. On radiovisiography (RVG) bone formation was seen in the affected area as early as 5 weeks

Key Words:

chronic osteomyelitis, vancomycin
impregnated polymethamethacrylate
(PMMA) beads

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INTRODUCTION

Chronic osteomyelitis is infection of the bone which usually occurs in elderly patients and mandible is more affected than maxilla [1]. Actinomyces, staphylocococcus aureus are the main causative agents [2].

Trauma, post extraction complication etc are the etiological factors. Patients present with pain, swelling, pus exudation. Radiolucent areas, bone destruction, sequestrum are some of the radiological features. Prolonged antimicrobial therapy and surgical debridement are the treatment of choice [3]. Adjunctive treatments such as gentamycin, tobramycin beads, hyperbaric oxygen etc. have been introduced [4].

Here we are presenting a patient of chronic osteomyelitis of mandible who was treated with intra-venous antimicrobial antibiotics, sequestrectomy, decortication followed by placement of vancomycin impregnated polymethamethacrylate (PMMA) beads.

History: An elderly female patient aged 55 years reported to department of Oral and Maxillofacial Surgery with chief complaint of non healing extracted tooth socket, pain and intra

oral diffuse swelling with 36, 37 regions since one year. There was history of dental extraction of 36, 37 one year back in a private dental clinic. The patient had pain in extraction area and the socket did not heal since then. On clinical examination there was non healing socket, tenderness, mild diffuse intra-oral swelling as shown in figure 1.

Radiographic features: On othopantomograph there was scattered areas of bone **destruction in which** there are islands of sequestrum as shown in figure 2.

Based on clinical, radiographic and histopathologic report a diagnosis of chronic osteomyelitis was made. Treatment plan: Routine investigations were carried out. The patient was started on intra-venous antibiotic therapy. The patient was taken under general anesthesia curettage, sequestrectomy, decortication was done in 36, 37 region. All the dead bone in the area was removed and vascularity in that area was achieved. Once hemostasis was achieved the vancomycin impregnated PMMA bead was placed in the socket and soft tissue was closed with resorbable sutures. The patient was kept on follow up. RVG was taken after 5 weeks which revealed bone formation

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Figure 1 Intra-oral photograph showing non healing socket



Figure 2 Orthopantomograph on presentation



Figure 3 Intra-operative photograph



Figure 4 Intra-operative photograph after bead placement and soft tissue closure

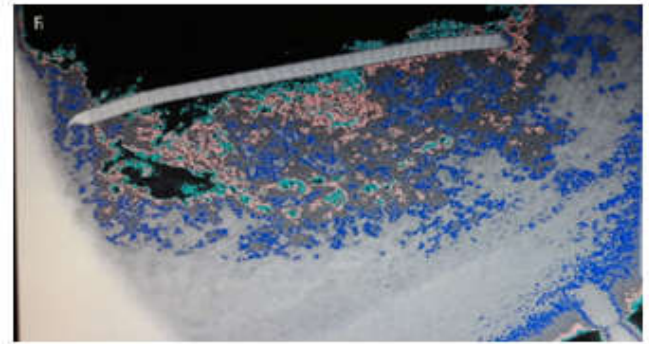


Figure 5 RVG showing bone formation

DISCUSSION

Chronic osteomyelitis usually occurs in fifth and sixth decade of life. Mandible is more affected than maxilla. Maxilla has more vascular supply and is cancellous bone hence osteomyelitis rarely occurs in maxilla [1].

In the above case chronic osteomyelitis occurred in mandible that is 36, 37 region.

In a study conducted among twenty two patients of chronic osteomyelitis of mandible and maxilla, actinomyces, fusobacterium, staphylocococcus aureus were the main causative agents[2].

Trauma, post extraction complication are some of the etiological factors of chronic osteomyelitis [3].

The patients with chronic osteomyelitis of mandible present with various clinical features such as recurrent pain, swelling, pus formation, fistula formation, in some cases there is hypaesthesia of mental nerve etc. [4, 3].

Radiolucent areas, bony destruction, sequestrum are radiological features. Malignant disease must be considered in differential diagnosis. Biopsy and culture must be done to establish for the diagnosis [3].

In the above case chronic osteomyelitis developed as a post extraction complication. The patient underwent extraction of 36,37 one year back following which the socket did not heal and the patient developed pain and mild diffuse swelling in that area. On radiograph there was scattered areas of bone destruction in which there are islands of sequestrum.

Various treatments are available for treatment of chronic osteomyelitis. These include medical management such as antimicrobial therapy along with surgical management such as sequestrectomy or decortication [1,3,4]. The main aim of surgical intervention in chronic osteomyelitis is removal of sequestrum [5].

Six cases of chronic osteomyelitis of mandible were reported over a period of 14 months period which were treated by prolonged antimicrobial therapy and surgical debridement [3]. Sixteen cases of chronic mandibular osteomyelitis are treated with sequestrectomy and decortications and intra-venous antibiotic therapy for one week followed by oral penicillin for 3 weeks. Only one case showed recurrence [4].

Adjunctive treatments such as gentamycin, tobramycin beads, hyperbaric oxygen have been introduced [4].

In the above case curettage, sequestrectomy, decortication was done. Once hemostasis was achieved vancomycin impregnated PMMA bead was placed and the site was sutured.

The chronic infection requires high level of antibiotics which is not without complications. This leads to introduction of local drug delivery methods such as antibiotic irrigation, infusion etc. High local concentration of antibiotics can be delivered with minimum systemic complications by using antibiotic impregnated PMMA beads. The other advantages include decreased hospital stay hence cost reduction, decrease in oral intake of drugs at home by the patient [6]. Antibiotic impregnated beads are being used in treatment of chronic osteomyelitis. These have several advantages over systemic therapy. Local antibiotic therapy has several advantages such as it decreases the complications of systemic antibiotic therapy and is less expensive than systemic drugs. Beads can be easily prepared just before the surgery and placed during initial surgery after debridement. Gentamicin, tobramycin, and vancomycin are the most commonly used antibiotics [5].

The antibiotic used must be stable and be able to withstand the high temperatures of curing process of acrylic. The antibiotic release depends on various factors such as the type of antibiotic, bead surface area and amount of antibiotic in the beads etc. Small amounts of antibiotics are released for various time durations ranging from 3 weeks to 5 years. Various antibiotics such as tobramycin, gentamicin etc have been used. In 3 cases, 2.4 mg tobramycin was used which is a broad spectrum aminoglycoside effective against gram negative and some gram positive organisms. It is thermally stable and high concentration of drug is released over a period of weeks. Attaining hemostasis and dead space elimination are two important factors during surgery before bead placement [6].

Vancomycin impregnated calcium sulfate was placed in 12 patients diagnosed with osteomyelitis of jaw. After debridement vancomycin impregnated calcium sulfate was placed and covered with acellular dermal matrix and sutured. There was satisfactory wound healing in ten patients, whereas in 2 cases of maxillary osteomyelitis required resuturing under local anaesthesia. Most of the implants were resorbed and replaced by new bone after 3 months as seen on panoramic radiographs. It was seen that calcium sulfate promotes new bone formation to a certain extent [7].

Vancomycin is safe, water soluble, thermally stable. Vancomycin is effective against *S.aureus* and when placed in bone cavity with calcium sulfate there is increased drug release during initial 4 to 5 hours which decreases, the drug release is maintained for 1 to 2 months [7].

Fifteen cases of mandibular osteomyelitis were treated with PMMA impregnated gentamicin beads. The systemic absorption of gentamicin was negligible [8].

Antibiotics can be delivered locally by PMMA, hydroxyapatite, calcium sulfate and calcium phosphate [7]. The drug carrier must be easy to make, non allergic, non toxic, must allow easy placement and removal from surgical site. The following properties are fulfilled by acrylic resin. Non resorbable sutures, stainless steel wires are used to string the acrylic beads [6].

Radiographic studies were carried out for 1008 cases of osteomyelitis of mandible. There was new bone formation in 114 cases. The radiographic pattern of periosteal new bone formation were of three types solid, laminated, one-layer. In majority of the cases the bone formation was solid type followed by laminated and one-layer type. In 82.5% the bone formation was in mandibular body and in 17.5% in ascending ramus [9].

Studies have shown that the extraction tooth sockets are filled by delicate cancellous bone in apical two thirds at 10 weeks and are completely filled by bone at 15 weeks as per the early human histological studies [10]. At around 1 month there was increased radiopacity and at 3 months the radiopacity was similar to that of surrounding bone [11].

During healing process of extracted socket osteoid is evident as uncalcified bony spicule at the end of first week. At 5 weeks the maximum bone density is reached [12].

In the above case the bone formation was studied on radiovisiography. New bone formation was seen as early as 5 weeks.

CONCLUSION

Treatment of chronic osteomyelitis of mandible with vancomycin impregnated PMMA beads is found to be useful.

References

1. Víctor Hiram Barajas-Pérez¹; Norith de Jesús Recendez-Santillan²; María Elisa Vega-Memije³; Alma Graciela García-Calderón⁴ & Juan Carlos Cuevas-González⁴. Chronic Suppurative Osteomyelitis of the Mandible Treated with Antibiotics Complemented with Surgical Treatment: A Case Report. *Int. J. Odontostomat.*, 11(3):261-265, 2017
2. Gaetti-Jardim Júnior E¹, Fardin AC, Gaetti-Jardim EC, de Castro AL, Schweitzer CM, Avila-Campos MJ. Microbiota associated with chronic osteomyelitis of the jaws. *Braz J Microbiol.* 2010 Oct; 41(4):1056-64.
3. Harris LF. Chronic mandibular osteomyelitis. *South Med J.* 1986 Jun; 79(6):696-7.
4. Van Merkesteyn JP¹, Groot RH, van den Akker HP, Bakker DJ, Borgmeijer-Hoelen AM. Treatment of chronic suppurative osteomyelitis of the mandible. *Int J Oral Maxillofac Surg.* 1997 Dec; 26(6):450-4.
5. Jaspaul S. Gogia, M.D.,¹ John P. Meehan, M.D.,¹ Paul E. Di Cesare, M.D.,¹ and Amir A. Jamali, M.D.¹ Local Antibiotic Therapy in Osteomyelitis. *Semin Plast Surg.* 2009 May; 23(2): 100-107.
6. Bruce B. Chisholm, Daniel Lew, Kalia Sadasivan. The use of tobramycin-impregnated polymethylmethacrylate beads in the treatment of osteomyelitis of the mandible: Report of three cases. *Joms* April 1993; 51(4): 444-449
7. Hai-Jiang Sun, MS, Lei Xue, MD, Chuan-Bin Wu, MS, Qing Zhou, DDS, PhD. Use of Vancomycin-Impregnated Calcium Sulfate in the Treatment of Osteomyelitis of the Jaw. *Joms* January 2017; 75(1):119-128
8. Grime PD¹, Bowerman JE, Weller PJ. Gentamicin impregnated polymethylmethacrylate (PMMA) beads in

- the treatment of primary chronic osteomyelitis of the mandible. Br J Oral Maxillofac Surg. 1990 Dec; 28(6):367-74.
9. Yasuhisa Hayashi, Kimishige Shimizutani, Yonoshin Kos eki. Radiographic study of periosteal new bone formation in osteomyelitis of the mandible. Oral Radiology June 1992; 8, (1):19–26
 10. Mangos JG. The healing of extraction wounds: a microscopic and radiographic investigation. *New Zealand Dental Journal*. 1941; 37:4–23
 11. Pagni G¹, Pellegrini G, Giannobile WV, Rasperini G. Postextraction alveolar ridge preservation: biological basis and treatments. *Int J Dent*. 2012;2012:151030.
 12. Baratam Srinivas, Pradipta Das, Moumita Maity Rana, Abdul Qahar Qureshi, Kedar C Vaidya, Shaikh Junaid Ahmed Raziuddin. Wound healing and bone regeneration in postextraction sockets with and without platelet-rich fibrin. *Ann Maxillofac Surg*. 2018 ; 8 (1): 28-34

How to cite this article:

Dr Vijaylaxmi Shettar and Shridhar Baliga., 2019, Treatment of Chronic Osteomyelitis of Mandible with Vancomycin Impregnated Polymethamethacrylate Beads and Recording Early Bone Changes: A Case Report. *Int J Recent Sci Res*. 10(04), pp. 31763-31766. DOI: <http://dx.doi.org/10.24327/ijrsr.2019.1004.3331>
