

Foreign Bodies in Potential Implant Sites

Chandra Sekar Anam^{1*} Ram B Basany² Aarti Saxena³ Hemanth Kumar⁴

¹Professor and Head, Department of Prosthodontics & Implantology, SVS Institute of Dental Sciences, Mahbubnagar, India.

²Senior Lecturer, Department of Prosthodontics & Implantology, SVS Institute of Dental Sciences, Mahbubnagar, India.

³Ex Reader, Department of Prosthodontics & Implantology, Pananeeya College of Dental Sciences, Hyderabad, India.

⁴Associate Professor, Department of Oral & Maxillofacial Rehabilitation, Ibsina National College for Medical Sciences, Jeddah, Saudi Arabia.

ABSTRACT

Background: Foreign body inclusions such as amalgam or root canal fillings in the jaw may occur during routine surgical and restorative dental procedures. Implantation of amalgam in the jaws may occur when broken bits of amalgam fall into an extraction socket during extraction of a tooth restored with amalgam or during apicoectomies and retrograde filling with amalgam. Despite numerous reports about the toxicity of amalgam, it is still one of the most commonly used dental restorative materials. Amalgam implantation in bone can result in foreign body reaction resulting in the formation of granulation tissue around it, with the removal of which, the bone can heal normally. Amalgam inclusion in tissues should be removed before placement of titanium implants as it can result in corrosion reaction of amalgam and release of ions which has a great potential for tissue allergies. The article presents a case report of an amalgam inclusion in bone, which was removed and the site being used for the placement of dental implant successfully.

Keywords: Implants, Foreign body, Dentistry.

INTRODUCTION

Foreign body inclusions in the jaw may occur during routine surgical and restorative dental procedures. Foreign bodies may be of metallic or non-metallic origin. Non-metallic foreign bodies stem from materials used for root canal treatment and non-metallic fillings. Metallic foreign bodies are usually amalgam remnants, which are incorporated in extraction wounds. Implantation of amalgam in the jaws may occur when a tooth with an amalgam filling is extracted and broken bits of amalgam filling fall into an extraction socket unnoticed or when an amalgam filling and a tooth extraction are done in the same appointment or during apicoectomies where the amalgam is being placed inside the alveolus and soft tissues are replaced on the top. [1]

Despite numerous reports about the toxicity of amalgam, it is still one of the most

commonly used dental restorative materials. Advances in dental material research and treatment often result in the coexistence of multiple kinds of metals in the oral cavity. Titanium placed in close proximity to amalgam accelerates the corrosion of amalgam with little change on titanium. Ions released from corroded amalgam have a great potential to cause tissue allergies. [2]

CASE REPORT

The following is a case report in which an implant was placed successfully in the mandibular jaw following removal of residual amalgam. A 59 year old male patient reported to the dental clinic for replacement of his missing teeth. The patient's medical history was insignificant. On examination, teeth 37 and 46 were missing. Restorative treatment options were explained to the patient and the patient opted for dental implants considering the advantages. A panoramic radiograph revealed a

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*Correspondence Dr. Chandra Sekar Anam.

Department of Prosthodontics & Implantology, SVS Institute of Dental Sciences, Mahbubnagar, India.

Email: Not Disclosed

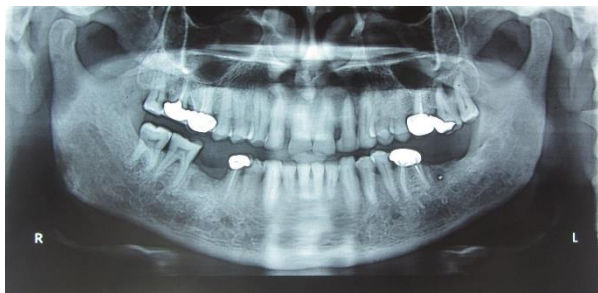


Fig 1: Panoramic radiograph showing a radiopaque metallic artifact on the right side of the alveolar ridge in the region of missing 37.



Fig 2: Panoramic radiograph showing a dental implant placed in the region of missing 37.

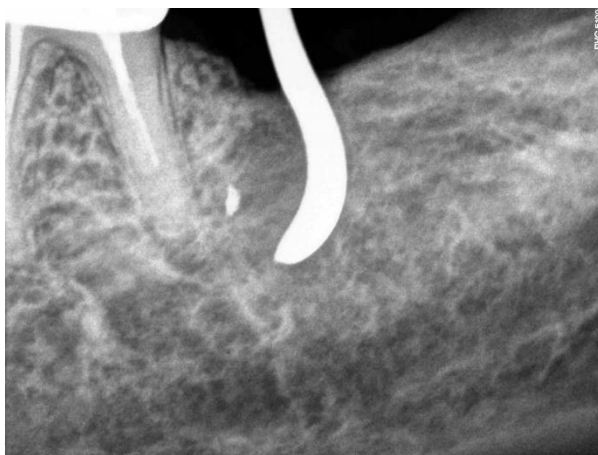


Fig 3: Dental radiograph showing curette positioned for the removal of amalgam particle in the region of missing 37.

2 mm radiopaque metallic artifact on the right side of the alveolar ridge in the region of missing 37 (Fig 1). The metallic artifact was surrounded by a radiolucent halo indicating inflammation around the artifact. The patient reported a traumatic extraction of a tooth with an amalgam filling in that region a year back with possible dislodgement of the amalgam into the extraction site. As implant placement and removal of the metal artifact were planned in the same appointment a CBCT was

advised for the patient. Granulation tissue with the central metallic inclusion were curettaged from the bone and a Nobel Replace Select 5mmx10mm implant was placed in the region of missing 37 (Fig 2). The metallic particle was identified as amalgam using Scanning Electron Microscopy (SEM).

DISCUSSION

Amalgam may be introduced in various ways in the jaws during routine dental procedures. If the particle is large enough, amalgam particles may be seen as radiopaque areas in the dental radiograph (Fig 3). Connective tissue response to amalgam varies greatly and depends on the particle size, composition of amalgam and depth of their location in the tissues. When larger fragments are incorporated, a granuloma consisting of multinucleated giant cells, lymphocytes, and increased fibrosis surrounds the foreign material. This reaction may be due to dissolution of amalgam by tissue fluids. When only small dust like particles are present, they are usually engulfed by individual histiocytes without formation of distinctive granuloma. [3]

Buchner et.al (2004) [4] observed no tissue reaction to embedded amalgam in 45% of the cases, while 17% had a macrophage reaction and in 38% a foreign body chronic inflammation was noted. Different phases of amalgam have different corrosion potentials. Animal experiments for soft tissue degradation of the three principal amalgam phases showed that gamma 2 (symbol) (tin-mercury) phase degrades rapidly and does not produce a tattoo, gamma (silver-tin) phase degrades slowly and builds up a strong amalgam tattoo. Gamma 1(silver-mercury) phase is intermediate between gamma 2 and gamma phase in respect to degradation and amalgam tattoo formation. [5]

The coexistence of dissimilar metals often brings about the risk of galvanic corrosion and release of ions from the metals into the surrounding tissues. A corrosion-resistant metal in single use might release noxious ions when placed in contact with other metals. Amalgam alloys are composed of silver, mercury, copper, tin, and zinc. Corrosion products of amalgam can be particularly detrimental to the tissues due to presence of toxic elements, such as mercury.

A rare case of exfoliative cheilitis possibly caused by mercury-containing dental amalgam in close proximity to dental titanium implant in a 41-year-old woman was reported by Paolo et.al [6]. Titanium implant placed in the vicinity of dental amalgam may trigger multiple sensitization to amalgam alloy, which is known to cause cheilitis.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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