

Chronic swelling from entrapment of acrylic resin in a surgical extraction site

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Abstract

When acrylic resin is inadvertently embedded in oral tissue, it can result in a pronounced chronic inflammatory response. This report describes a case in which temporary crown and bridge resin was forced into a surgical extraction site after the two adjacent teeth were prepared for a bridge immediately following extraction of a maxillary premolar. The patient experienced swelling at the extraction site over a ten month period despite treatment with antibiotics and anti-inflammatory drugs. After detection and removal of the foreign body, the symptoms resolved. The episode contributed to periodontal bone loss around an adjacent tooth. While morbidity of this nature is rare, this case reinforces the need to investigate persistent signs of inflammation and account for dental materials that are lost during the course of treatment.

Keywords: Dental extraction complication, dental materials, foreign body, inflammation

Introduction

When embedded in tissue, dental acrylic resins produce adverse foreign body responses.^[1,2] They stimulate expression of certain proinflammatory cytokines^[3] and adsorb plasma proteins, which initiate immune response cascades that stimulate macrophage infiltration and multinuclear giant cell formation.^[4] Cytokines produced by giant cells and macrophages recruit other inflammatory cells and stimulate fibrous encapsulation of the material by fibroblasts. Encapsulation isolates the material from the surrounding tissue, facilitating foreign body elimination and tissue repair. However, failure to phagocytize the material is often associated with release of damaging lysosomal enzymes and reactive oxygen species.^[5] This report describes a case in which polymerizing resin was forced into a surgical extraction site, where it remained for ten months.

Case Report

A healthy 45-year-old Caucasian female presented with swelling and discomfort in the upper right posterior area, which had persisted since the extraction of her upper right second premolar. The tooth had been restored with a large amalgam [Figure 1]. When it fractured ten months earlier, it was deemed non-restorable. The tooth had a mesial root curvature and required surgical extraction. Immediately after the extraction, the adjacent teeth were prepared for a fixed prosthesis and a temporary bridge was fabricated.

No postoperative radiographs were exposed during this appointment.

The patient returned the following day with pain, swelling, and facial bruising. Her dentist prescribed ibuprofen and cold compresses, but the swelling failed to resolve. When symptoms persisted to the eleventh post-operative day, her dentist removed the temporary bridge, curetted the extraction site, and prescribed clindamycin. When she was re-evaluated on the twenty-third postoperative day, there was continued swelling, but wound healing appeared to be progressing. Within three months after the extraction, the site was covered by intact keratinized tissue. Although the swelling had not resolved, the permanent bridge was completed and cemented.

The patient presented to our practice seven months later for investigation of the swelling. Radiographs revealed a radiopaque object distal to the upper right first premolar and a mesial osteotomy defect [Figure 2]. A segmental osteotomy

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Figure 1: Periapical radiograph of the maxillary right posterior teeth, taken 53 months prior to extraction of the upper right second premolar

performed thirty years earlier to correct a maxillary midline discrepancy had failed to heal completely. The edentulous site exhibited firm facial swelling, but did not appear granulomatous. After obtaining local anesthesia, a facial full thickness flap was reflected from the distal of the first molar to the distal of the canine. An encapsulated acrylic object and associated granulation tissue were removed [Figure 3]. Severe bone loss was noted distal to the first premolar. Since the site was inflamed and access was limited by the bridge, no bone graft was placed prior to wound closure. At a follow-up appointment one month later, there were no signs of abnormal healing. However, the gingival margin on the distofacial and distal aspects of the premolar had receded 2.5 mm in conjunction with tissue shrinkage at the edentulous site.

Final healing was evaluated eight months later. Probing depths were acceptable and inflammation was largely absent. Gingival recession previously noted around the first premolar had not progressed. A radiograph suggested that the density of the bone distal to the first premolar had increased [Figure 4]. Given these findings, it was feasible for the patient to retain the bridge.

Discussion

The decision to prepare teeth adjacent to a fresh surgical extraction site contributed to the complication described in this report. Acrylic was presumably forced into the surgical site during fabrication of the temporary bridge, molded by the socket, and later displaced by postoperative curettage. If a connection had persisted between the entrapped acrylic and the temporary bridge, the entrapped mass might have been discovered. From the earliest postoperative stages, the patient experienced swelling and delayed healing that persisted despite treatment with curettage, anti-inflammatory agents, and antibiotics. This resistance to treatment signaled the need for further investigation. A radiograph would have been the single most useful source of information to explain the delayed healing. Ultimately, healing progressed to fibrous encapsulation of the acrylic mass. By isolating the foreign body from the bone and the oral environment, encapsulation may have limited bone loss, reduced the magnitude of inflammatory episodes and enhanced the potential for favorable osseous healing. While complications of this nature are rare, this case reinforces the need to account for all materials introduced into the oral cavity, investigate the etiology of persistent swelling and inflammation, and incorporate time for complete postoperative healing in the treatment sequence.

In cases of foreign body gingivitis, histological evaluation shows granulomatous foci contained particles of foreign material that are often inconspicuous and easily overlooked^[6]. Home care recommendations of patients with foreign body

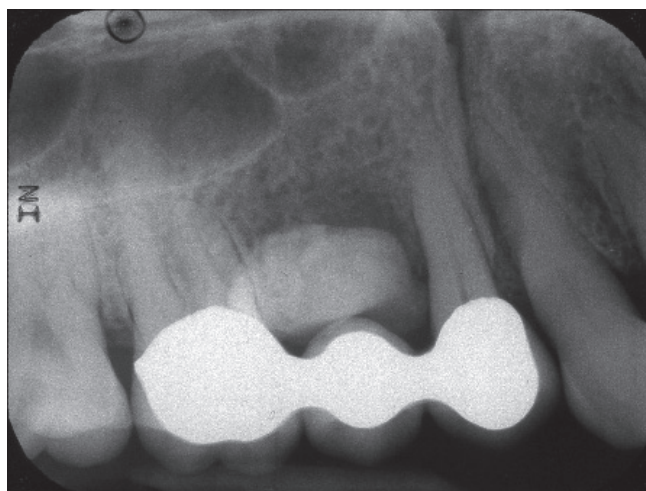


Figure 2: Periapical radiograph of the maxillary right posterior teeth, taken 9 months after extraction of the upper right second premolar

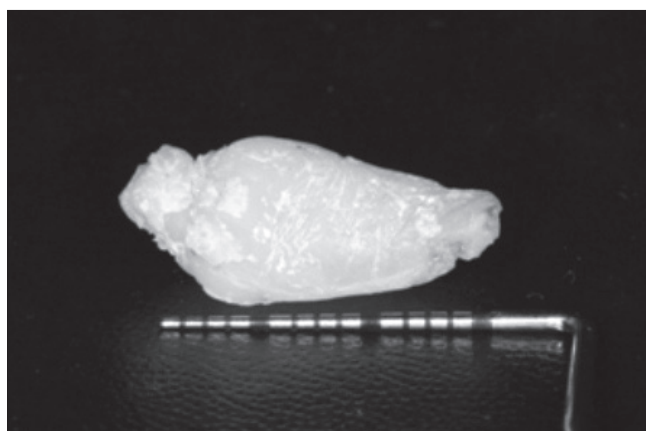


Figure 3: Longitudinal view of the resin foreign body after surgical removal from the upper right second premolar extraction site

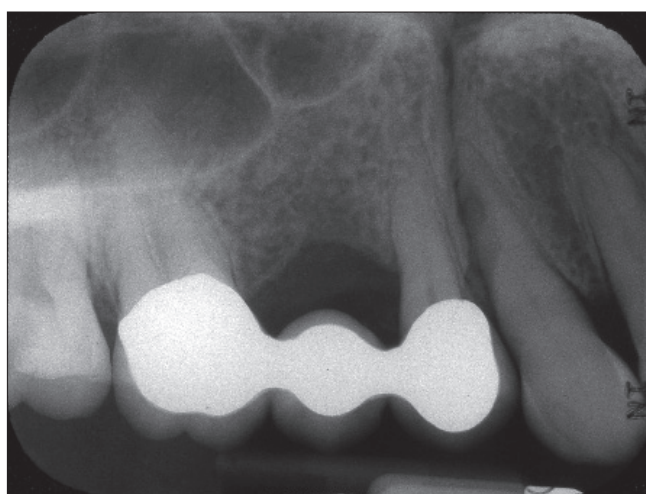


Figure 4: Post-operative radiograph of the maxillary right posterior teeth, taken 8 months after removal of the foreign body

gingivitis include avoidance of dentifrices with certain chemical additives and rinses with high alcohol content^[7].

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