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Case Report

Pseudoaneurysm of facial artery after bilateral sagittal split osteotomy, complicated by infection after embolization

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ABSTRACT

This is a case report regarding the postoperative complication of pseudoaneurysm of the facial artery likely due to mechanical injury after a bilateral sagittal split osteotomy (BSSO). This article will discuss diagnosis, management, embolization therapy using Onyx (ethylene vinyl alcohol copolymer in dimethyl sulfoxide – DMSO) and review the literature on pseudoaneurysm formed after bilateral sagittal split osteotomy. We will also discuss the common embolic agents and apparent adverse reaction of local infection that may be due to the presence of residual Onyx in the soft tissues.

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1. Introduction

Orthognathic surgery has been proved highly successful with predictable results and low complication rates. However, some of the complications include hemorrhage, nonunion, infection, nerve injury, and foreign bodies [1]. Teltzrow et al. has indicated that 1.2% of 1264 patients suffered from bleeding complications. Vascular complications associated with arterial injuries are rare. However, there are several reported cases of injury to the distal facial artery, maxillary artery, and superficial temporal artery due to close proximity along the surgical sites [2].

A pseudoaneurysm is an extremely rare complication following BSSO. There are only a few reported cases that occurred postoperatively, which involved the maxillary and the facial artery [3,4]. A pseudoaneurysm is a vascular complication that is caused by an incomplete tear of the arterial vessel wall, which causes blood flow around the surrounding tissues with persistent leakage that

expands over time. A pseudoaneurysm can be differentiated from a true aneurysm, which is defined by collection of blood inside all layers of arterial walls. To our knowledge, this is the first case of a pseudoaneurysm of the facial artery that occurred in the span of four days complicated by infection in response to the Onyx material used for embolization.

2. Case report

A 15-year-old male, with a history of asthma and mild obstructive sleep apnea (OSA), presented to the hospital with multifaceted facial skeletal deformity including apertognathia, maxillary two-plane occlusion with posterior vertical assess, transverse arch discrepancy, mandibular retrognathia and laterognathia. The patient underwent 4-piece segmental Le Fort I osteotomy to level the maxillary arch with impaction of the posterior segments, and a BSSO to achieve a 10 mm mandibular advancement (Fig. 1A and B).

The sagittal split osteotomies were performed using the Hunsuck modification approach with the lateral osteotomies made around the first molar. A channel retractor was used to protect lateral inferior soft tissues. A cured aneurysm needle was passed from medial to lateral so that a circummandibular vicryl suture could be placed as part of our standard rigid fixation or nonrigid fixation protocol. The sagittal osteotomies proceeded uneventfully, with no unusual or significant bleeding noted. The patient

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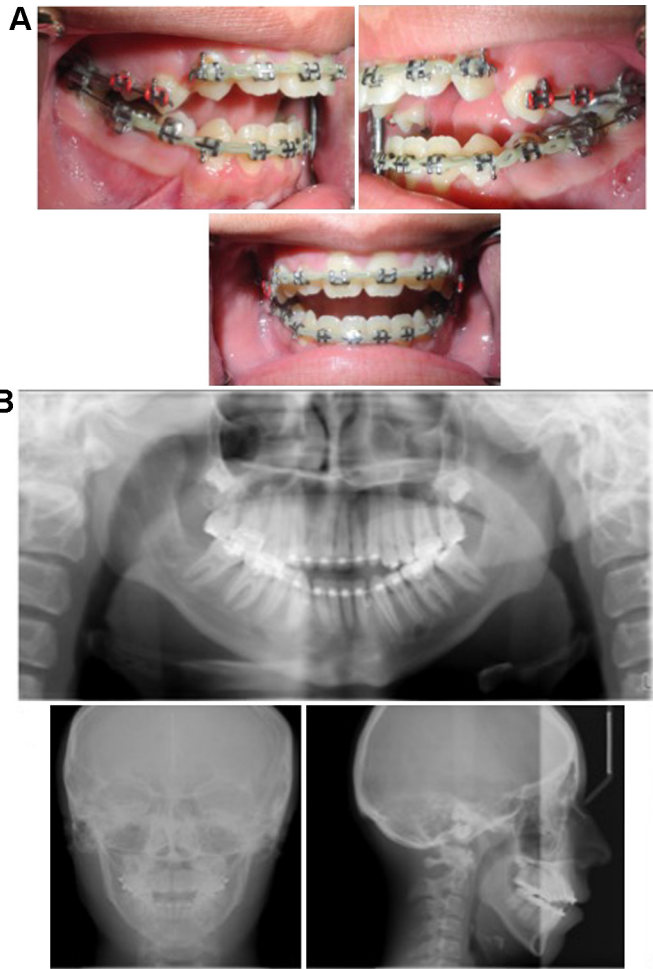


Fig. 1. (A) Preoperative photographs indicating retrognathic mandible with a mild laterognathic component. There is a two-plane occlusion with posterior vertical access and transverse arch discrepancy. (B) Panoramic image, anterior posterior cephalometry (AP ceph), and lateral cephalometry (lateral ceph) preoperatively.

underwent postoperative imaging and was discharged the following day (Fig. 2).

The initial postoperative course was unremarkable. The patient experienced some mild bleeding from the left mandibular incision associated with coughing on the 3rd postoperative day and this resolved with local pressure. Local bleeding occurred in greater volume with physical exertion early on postoperative day 4, and the patient was seen in the emergency department (ED) for evaluation. Upon arrival at the ED, the patient was afebrile, normotensive, with a mild tachycardia (low 90s). Upon clinical exam, the left mandibular surgical site was noted to have mild intermittent bleeding with noticeable pronounced left sided swelling that was tender to palpation. The site was suctioned, cleaned, irrigated, and subjected to local direct pressure with gauze. Good hemostasis was readily achieved, and the patient was monitored for several hours. The wound remained hemostatic while at rest, but the bleeding returned following ambulation, which responded to local compression, bed rest and observation. However, several hours later, brisk pulsatile bleeding occurred from the left mandibular surgical site while the patient began to ambulate. Although local compression achieved temporary hemostasis, it was decided to return the patient to the operating room for management of what was presumed to be a local arterial bleed.

Intraoperatively, the bleeding appeared to be originating within soft tissues beneath the mandibular lateral osteotomy, in the region



Fig. 2. Postoperative IMAGES indicating mandible border alignment, stable bilateral posterior occlusion, midline on, condyles seated, and plates/screws in place.

of the antegonial notch. Local measures including electrocautery and hemoclips achieved good clinical hemostasis. However, during closure and with bringing the blood pressure to a normotensive level, heavy pulsatile bleeding recurred. The Interventional Neuroradiology (INR) service was consulted for embolization under general anesthesia and the patient was transferred to their procedure suite. Angiography indicated a leaking pseudoaneurysm of the facial artery, which was readily managed through embolization with Onyx (Fig. 3A and B). The patient experienced no further bleeding episodes and was discharged from the hospital the next day. The remainder of his early postoperative course was uneventful.

Four months following the surgery, the patient developed tenderness on the lower left region of the mandible with radiographic

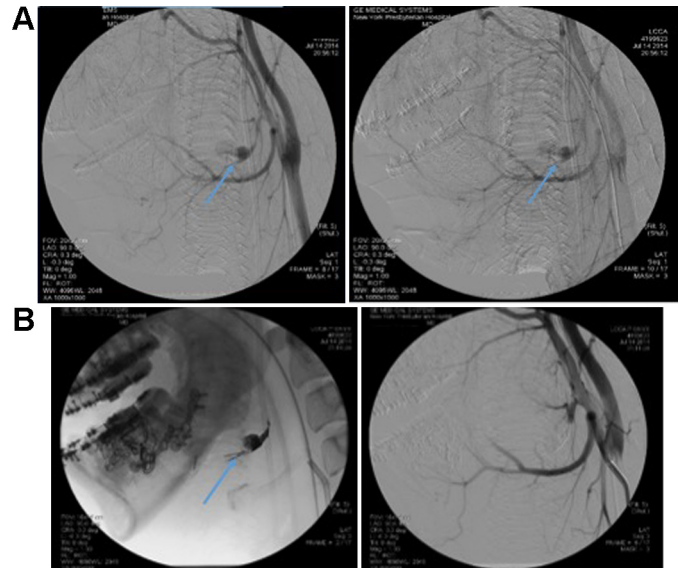


Fig. 3. (A) Angiography localizing the pseudoaneurysm of the left facial artery. (B) Angiogram of the embolization of pseudoaneurysm of left facial artery with Onyx.

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