



## A Rare Case of Pseudoaneurysm in the Alveolar Inferior Artery as A Late Complication of the Sagittal Split Osteotomy

Gabriel Conceição Brito<sup>1\*</sup>, Karoline Von Ahn Pinto<sup>2</sup>, Carolina Siqueira da Silva<sup>2</sup>, Cecília Luiz Pereira Stabile<sup>3</sup>  
Gláukon Alex Vitti Stabile<sup>3</sup>

<sup>1</sup>DDS, MSc. Division of Oral and Maxillofacial Surgery, Department of Oral Diagnosis, Universidade Estadual de Campinas (UNICAMP), Piracicaba School of Dentistry, Piracicaba, São Paulo, Brazil.

<sup>2</sup>DDS, Department of Oral Medicine and Pediatric Dentistry, State University of Londrina, Londrina, Parana, Brazil

<sup>3</sup>DDS, MSc, PhD, Professor, Department of Oral Medicine and Pediatric Dentistry, State University of Londrina, Londrina, Parana, Brazil.

### Article Info

**Received:** November 20, 2025

**Accepted:** November 27, 2025

**Published:** December 01, 2025

**\*Corresponding author:** Gabriel Conceição Brito, DDS, MSc. Division of Oral and Maxillofacial Surgery, Department of Oral Diagnosis, Universidade Estadual de Campinas (UNICAMP), Piracicaba School of Dentistry, Piracicaba, São Paulo, Brazil, Phone number: +5591982880052  
Zip-code: 13416389.

**Citation:** Gabriel C Brito, Ahn Pinto KV, da Silva CS, Pereira Stabile CL, Vitti Stabile GA. (2025) "A Rare Case of Pseudoaneurysm in the Alveolar Inferior Artery as A Late Complication of the Sagittal Split Osteotomy.", International Surgery Case Reports, 7(3); DOI: 10.61148/2836-2845/ISCR/109.

**Copyright:** © 2025. Gabriel Conceição Brito. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

### Abstract

Pseudoaneurysm following bilateral sagittal split osteotomy (BSSO) is a rare complication, and reported cases typically involve the facial artery. This manuscript describes a pseudoaneurysm of the inferior alveolar artery as a late postoperative complication of BSSO. A 20-year-old male with a Class III dentofacial deformity underwent bimaxillary orthognathic surgery. During the procedure, a bad split occurred on the left side of the mandible, requiring corrective osteotomy; the remainder of the surgery proceeded uneventfully. Postoperatively, the patient developed swelling associated with a pulsatile mass on the left mandible. He was referred to vascular surgery, where imaging confirmed a pseudoaneurysm of the left inferior alveolar artery. Ultrasound-guided external compression was selected as the treatment modality. Compression was maintained for two weeks until complete clinical and radiological resolution of the lesion. This case highlights an uncommon vascular complication of BSSO and reinforces the importance of early recognition and appropriate management.

**Keywords:** BSSO; surgery

### Introduction:

Pseudoaneurysms (PA), also termed false aneurysms, are a leakage of arterial blood, after a rupture of arterial endothelium, into the surrounding tissue with a persistent communication between the originating artery and the resultant adjacent cavity with the formation of a pulsating hematoma, which may lead to hemorrhage<sup>1</sup>. It's different from aneurysms, which are well-defined and abnormal dilations of blood vessels, that may be caused by trauma or flaccidity of the vessel walls, with preservation of all arterial layers<sup>2</sup>.

Bilateral sagittal split osteotomy (BSSO) is the most frequently used osteotomy in orthognathic surgery to correct the mandibular position. It's a procedure with a low incidence of complications that require urgent care. Pseudoaneurysm after a BSSO is a rare complication, with few reported cases, and is mostly related to the facial artery<sup>3</sup>.

The purpose of this study is to report a case of pseudoaneurysm of the inferior alveolar artery as a late complication of bilateral sagittal split osteotomy after a bad split.

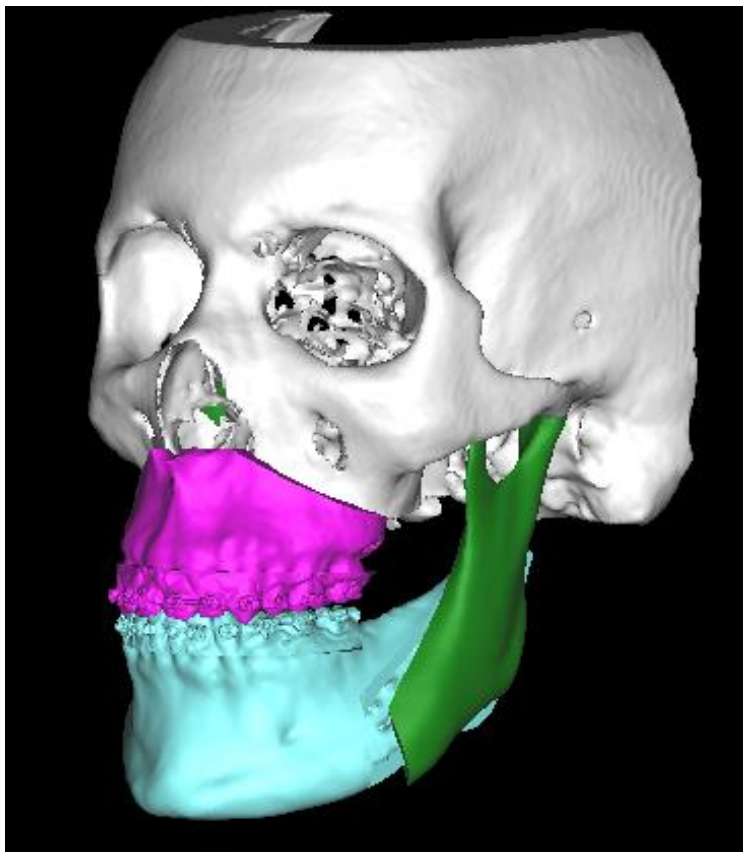
## Case Report

A 20-year-old male patient with no associated comorbidities was referred to the Oral and Maxillofacial Surgery Division of the Londrina University Hospital and diagnosed with a dentofacial pattern class III associated with a maxillary vertical

excess. (Figure 1). Orthognathic surgery was recommended to improve facial harmony and the function of the stomatognathic system. Surgical planning involved a maxillary impaction and bimaxillary advancement, starting with the mandible. (Figure 02). Preoperative laboratory tests and cardiology assessment showed no alterations.



**Figure 1:** Preoperative open-bite occlusion of a patient with a dento-skeletal dentofacial pattern class III with vertical maxillary excess.

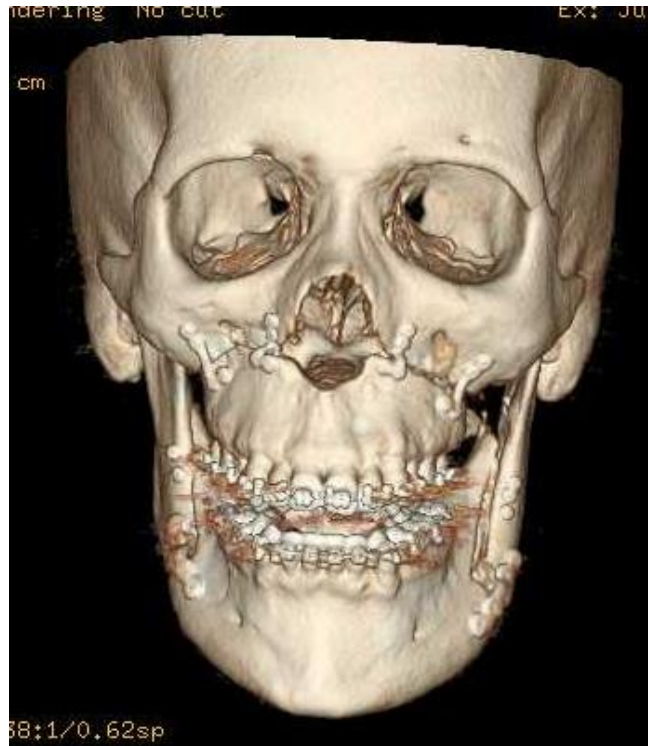


**Figure 2:** Virtual planning with ProPlan CMF (Materialise) software: bimaxillary orthognathic surgery with the correction of occlusal plane.

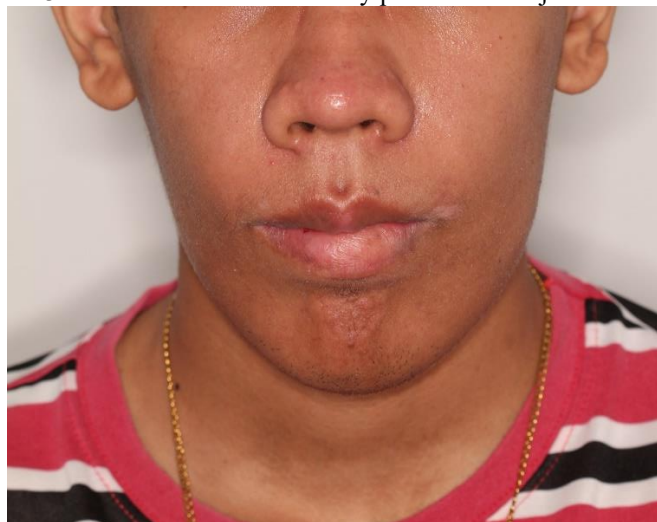
The surgical procedure was performed under general anesthesia with controlled hypotension. During the surgery, a Smith ramus separator and Smith sagittal split separators were used to complete the separation of the distal segment from the proximal segment. During the separation of the left side, a bad split occurred. Then, the correction of the osteotomy was achieved by performing the separation correctly at the base of the mandible with a reciprocating saw. After this complication was managed, surgery continued uneventfully, and no other problems were identified during the intraoperative.

The patient remained hospitalized for two days postoperatively with no complications and was discharged home after a computed tomography scan showed no alterations (Figure

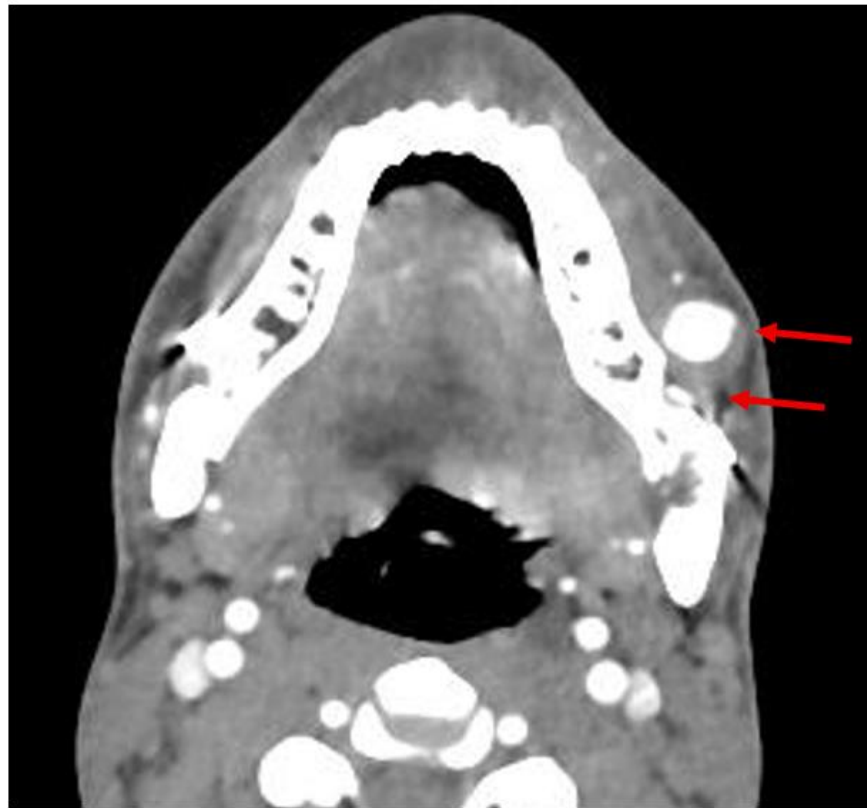
3). At the two-week follow-up, he reported a slight swelling on the left mandibular body, with no associated pain and no progression. On clinical examination, a pulsating mass was observed at the posterior mandibular vestibule on the left side. (Figure 4). Due to the characteristics of the lesion during physical examination, the diagnostic hypothesis of vascular origin was raised, and an Angio tomography (angio-CT) was requested. A hyperdense lesion was observed in the region of the mandibular body on the left side (Figure 5). Therefore, the patient was referred to the vascular surgery team, whose diagnostic hypothesis after ultrasonography was a pseudoaneurysm of the left inferior alveolar artery. (Figure 6).



**Figure 3:** Post-operative 3D reconstruction: satisfactory position of the jaws. No alteration was observed.



**Figure 4:** Two weeks post-operative: slight increase in volume in the region of the left mandibular body associated with a pulsating nodule in the mandibular vestibule.



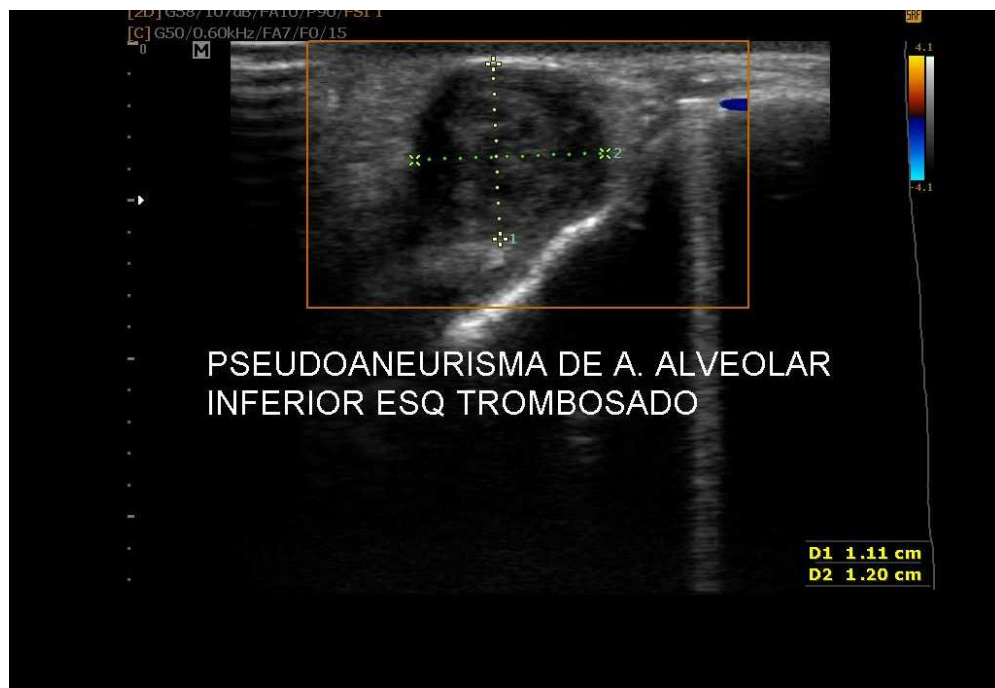
**Figure 5:** Post-operative CT angiography showing a hyperdense lesion adjacent to the left mandibular body, consistent with a vascular abnormality. Its superior position relative to the mandible, along with imaging evidence indicating the site of its neck (arrows), is suggestive of origin from the inferior alveolar artery.



**Figure 6:** Ultrasonography suggested a pseudoaneurysm on the alveolar inferior artery.

The vascular surgery team managed the pseudoaneurysm conservatively, using a compression technique guided by ultrasound. After 2 weeks of follow-up, the pseudoaneurysm of the alveolar inferior artery had been thrombosed (Figure 7). The case has been followed up for 06 months so far, and the patient did not present new vascular alterations or clinical changes. (Figure 8).





**Figure 7:** Ultrasonography showed the PA thrombosed after management with compression.



**Figure 8:** 06 months postoperative with final occlusion as planned. Patient without swelling or pulsatile nodule.

## Discussion

In the head and neck region, PA varies clinically in terms of its manifestations. It is commonly linked to a slow-growing mass that may be associated with swelling of the face and pain, a pulsating mass, neurological deficit, bleeding, dysphagia, pain in the maxillo-facial region, and thromboembolism<sup>2,4</sup>

The incidence of bad split is around 2.3% for sagittal osteotomies of the mandibular ramus<sup>5</sup>. Although rare, vascular complications associated with orthognathic surgery can occur. Pseudoaneurysms as a complication of BSSO are very rare<sup>6,7,8,15</sup>, and, in our research, just one case has been associated with the alveolar inferior artery<sup>3</sup>.

In the present case, the pseudoaneurysm was likely associated with the more extensive surgical trauma after the correction of the bad split that occurred during the separation of the left mandibular osteotomy.

AlQahtani et al 2023, in a systematic review analysing orthognathic surgery and pseudoaneurysms, reported that the most common procedure associated with PAs was the LeFort I osteotomy, followed by bilateral sagittal split osteotomy. Furthermore, of the 21 patients, 9 had PAs in the maxillary artery, whereas 6 had PAs in the facial artery. The sphenopalatine artery was involved in 3 patients<sup>9</sup>

Angio-CT is considered the best method for diagnosing PA, as it

enables visualization of the entire vascular architecture<sup>6,7</sup>. Another important tool is the Doppler ultrasound, which detects fluid turbulence and vessel dilation with a 95% accuracy in PA<sup>10,11</sup>. Both imaging methodologies were used to aid the diagnosis and follow-up of the present case. Needle aspiration should be avoided due to the risk of significant hemorrhage, of difficult to manage in an office setting<sup>12</sup>. On CT angiography, the superior position of the pseudoaneurysm relative to the mandible, together with the image suggesting the origin of its neck as indicated by the arrows in Figure 5, and the complementary ultrasound findings, led the vascular surgery team to conclude that the pseudoaneurysm originated from the inferior alveolar artery.

False aneurysm treatment cannot be neglected, due to its fragile walls and tendency to expand and progress, which can lead to serious complications like rupture, hemorrhage, compression of adjacent nerves, or release of thromboembolic events, in addition to the risk of secondary infections and/or impaired cerebral perfusion. Therefore, treatment should not be delayed.<sup>11</sup>

PA treatment options vary from invasive approaches, such as exploration and surgical ligation, to less invasive ones, such as simple compressions. Compression is achieved by pressure over the neck of the pseudoaneurysm, altering the flow inside it, and then generating its interruption, which will lead to thrombosis and obliteration of the cavity.<sup>13,14,15</sup> In the reported case, the less invasive treatment with compression, after 02 sessions, was effective for resolution.

Pseudoaneurysms are late vascular complications present after orthognathic surgery. These injuries after sagittal split osteotomy and, more specifically, affecting the inferior alveolar artery are rare findings in the literature.<sup>3,16</sup> Due to its potential to generate more serious complications and greater repercussions for patients, surgeons should be able to diagnose and recommend appropriate treatment of this condition.

## References:

1. Rawat SK, Singh D, Suresh Babu P, George R, Mongia P. Traumatic Pseudoaneurysm: A Life-Threatening Complication After Surgical Extraction of Impacted Maxillary Third Molar. **J Maxillofac Oral Surg**. 2019 Mar;18(1):57-60. Epub 2018 May 12. PMID: 30728693; PMCID: PMC6328830.
2. Rayati F, Parsa H, Abed PF, Karagah T. Facial artery pseudoaneurysm following surgical removal of a mandibular molar. **J Oral Maxillofac Surg**. 2010 Jul;68(7):1683-5. Epub 2009 Dec 16. PMID: 20018419.
3. AbuKarky A, Al Mousa M, Samara OA, Baqain ZH. Pseudoaneurysm in the inferior alveolar artery following a bad split in bilateral sagittal split osteotomy. **Int J Oral Maxillofac Surg**. 2021 Jun;50(6):798-800. Epub 2020 Dec 22. PMID: 33358377.
4. Wang D, Su L, Han Y, Fan X. Embolization treatment of pseudoaneurysms originating from the external carotid artery. **J Vasc Surg**. 2015 Apr;61(4):920-6. Epub 2014 Dec 10. PMID: 25498162.
5. Steenen SA, Becking AG. Bad splits in bilateral sagittal split osteotomy: systematic review of fracture patterns. **Int J Oral Maxillofac Surg**. 2016 Jul;45(7):887-97. Epub 2016 Feb 28. PMID: 26936377.
6. Chakrabarty S, Majumdar SK, Ghatak A, Bansal A. Management of Pseudoaneurysm of Internal Maxillary Artery Resulting from Trauma. **J Maxillofac Oral Surg** 2015; 14:203–8.
7. Shetty NK, Shandiya R, Pawar S, Gadre PK, Gadre K, Singh D: Management of Late Post-traumatic Facial Artery Pseudoaneurysmal Cyst: Review of Literature. **J Maxillofac Oral Surg**. 2015 Jun; 14(2): 201–205. Published online 2014 Aug 13.
8. Et AS, Guo W, Loveless T, Dhaliwal SS, Quereshy FA, Baur DA, Kaka NS: Pseudoaneurysm of the external carotid artery secondary to subcondylar fracture. **Int. J. Oral Maxillofac Surg**. 2011; 40: 644-646.
9. AlMofreh AlQahtani F, Kuriadom ST, Bishawi K, AlAssiri N. Pseudoaneurysms and Orthognathic Surgery: A Systematic Review and a Proposed Algorithm of Treatment. **J Craniofac Surg**. 2023 May 1;34(3):1031-1035. Epub 2022 Nov 15. PMID: 36377043.
10. Bodanapally U K, Dreizin D, Sliker C W, Boscak A R, Reddy R P. Vascular injuries to the neck after penetrating trauma: diagnostic performance of 40- and 64-MDCT angiography. **AJR Am J Roentgenol**. 2015;205(4):866–872.
11. Ribeiro Ribeiro AL, Brasil da Silva W, Alves-Junior Sde M, de Jesus Viana Pinheiro J. Giant life-threatening external carotid artery pseudoaneurysm caused by a mandibular condylar fracture. **Oral Surg Oral Med Oral Pathol Oral Radiol**. 2015 Mar;119(3):e95-e100. Epub 2014 Sep 16. PMID: 25442245.
12. Singh EE, Barry MC, Ireland A, Haynes DB. Current Diagnosis and Management of Blunt Internal Carotid Artery Injury. **Europeans jornal vascular and Endovascular Surgery**. 2004.27; 557-584.
13. Alonso N, Bastos EO, Massenburg BB. Pseudoaneurysm of the internal maxillary artery: A case report of facial trauma and recurrent bleeding. **Int J Surg Case Rep**. 2016; 21:63–66.
14. Gold M. Partially Thrombosed Internal Maxillary Pseudoaneurysm after Gunshot Wound. **Craniofacial Trauma Reconstr**. 2016 Nov;9(4):335-337. Epub 2016 Apr 19. PMID: 27833712; PMCID: PMC5101118.
15. Nogueira ACS, Salgado CG, Nogueira FBS, Amaral SI, Rabischoffsky A. Pseudoaneurysms: when and how to treat them. **ABC: imagem cardiovascular / Sociedade Brasileira de Cardiologia**. Vol.26, no.4 (2013) - São Paulo ISSN 2318-8219
16. H.W. Jo, Y.S. Kim, D.H. Kang, S.H. Lee, T.G. Kwon: Pseudoaneurysm of the facial artery occurred after mandibular sagittal split ramus osteotomy. **Oral Maxillofac Surg**, 17 (2013), pp. 151-154.