

Arteriovenous fistula after temporomandibular joint arthroscopy successfully treated with embolization

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Abstract. Temporomandibular joint arthroscopy is a minimal invasive surgical procedure commonly used to effectively treat some internal derangement of the TMJ. However, this method is not free of complications. Arteriovenous fistula (AVF) is a lesion that communicates the high flow arterial system and the low flow venous network. We describe a new case of preauricular traumatic AVF successfully treated with external carotid embolization, along with a review of the medical literature.

Key words: arteriovenous fistula;
temporomandibular joint arthroscopy;
complications; arterial embolization.

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Arteriovenous fistula (AVF) is a lesion that communicates the high flow arterial system and the low flow venous network. They used to be secondary to a traumatic injury, although congenital and spontaneous cases have been reported¹.

Nowadays, temporomandibular joint (TMJ) arthroscopy is a minimal invasive surgical procedure commonly used to effectively treat some internal derangement of the TMJ⁹. However, this method is not free of complications, and the articular surfaces and disk, the facial nerve and the superficial temporal vessels may be damaged^{5,10}.

Nevertheless, only five well-documented cases of AVF secondary to arthroscopy of the TMJ have been reported in the English literature^{2,3,8,9,11}. We describe a new case of preauricular traumatic AVF successfully treated with external carotid embolization, along with a review of the medical literature.

Case report

A 21-year-old Caucasian female was referred with the complaint of a sudden limitation of the mandibular opening 6 months ago. She also mentioned facial pain while chewing. Her past medical history was unremarkable with no traumatic antecedents. On examination, an oral opening of 23 mm with deviation of the mandible toward the right side was assessed. An MRI of the TMJ was made, and an anterior right side disk displacement without reduction was found. A subsequent splint therapy was installed, without satisfactory results 6 months later. Therefore, the patient underwent an arthroscopy of her left TMJ. This procedure was uneventful using a standard posterolateral approach, performing a lysis and lavage technique. In the first visit 15 days after surgery the patient referred a pulsatile tinnitus not modified with changes of position. On examination a palpable thrill and an

audible bruit were observed. A CT-angiography was made and a vascular lesion on the preauricular right area was found (Fig. 1). With the diagnosis of an AVF secondary to arthroscopy, the patient underwent a facial angiography through a femoral cannulation. This test revealed a high-flow AVF between the superficial temporal artery and the pterygoid venous plexus with an enlargement of the external carotid arterial system (Fig. 2). Therefore, an immediate embolization of the feeding vessels with two platinum coils was carried out (Fig. 3). Shortly after this procedure the thrill and the bruit disappeared. The panoramic radiograph showed the radiopaque titanium coils over the right TMJ area (Fig. 4), without recurrence of the fistula 6 months after the embolization. On addition, her articular symptoms improved with an oral opening of 45 mm without mandibular deviation

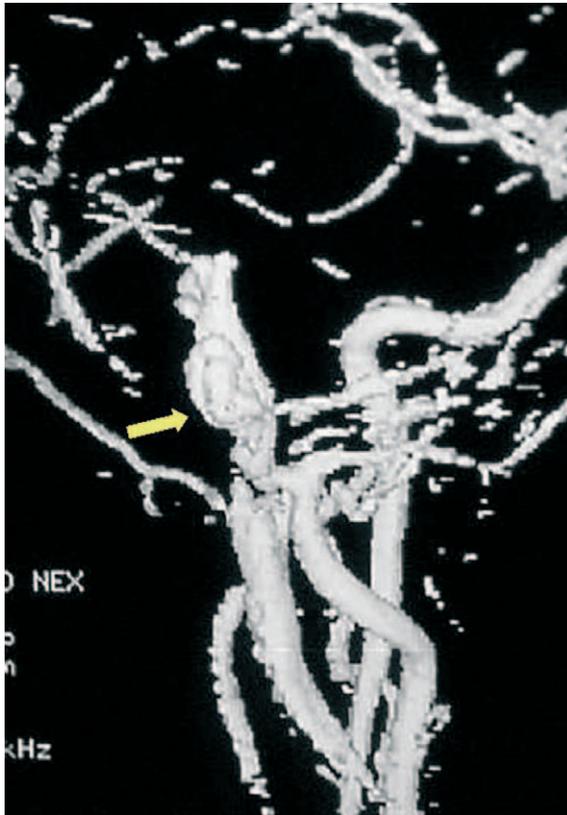


Fig. 1. Three-dimensional CT-angiography of the carotid vessels where a vascular lesion in the territory of the external carotid artery can be observed (arrow).

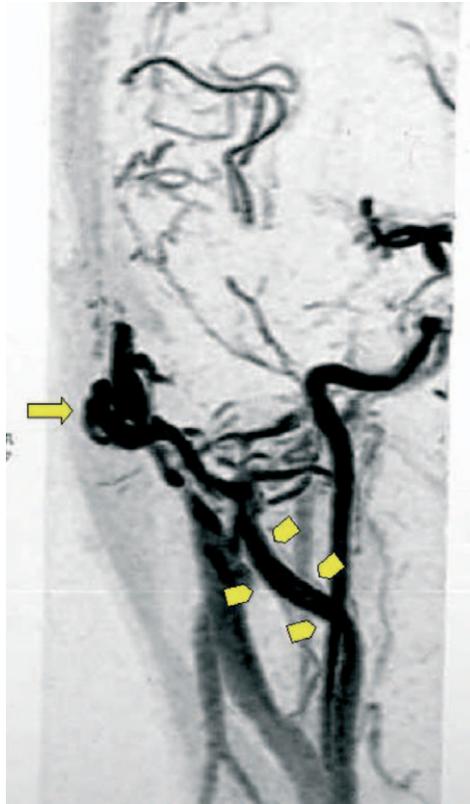


Fig. 2. View of the AV fistula between the superficial temporal artery and the pterygoid venous plexus in a peripheral arteriography (arrow). Note the enlargement of the external carotid system (arrowheads).



Fig. 3. Supraselective angiography of the carotid vessels. Preauricular AVF can be observed before (above) and after embolization of the nutrient vessels with two titanium coils (inferior).

Discussion

Complications of arthroscopy of the TMJ are uncommon. The incidence varies from 1.7% to 10.3%^{3,6,12}. A study of CARTER and SCHWABER, classified these as neurologic, vascular, otologic, inflammatory, infectious, instrument failure and anaesthetic complications⁴. Nevertheless, McCain suggested that intra-articular damage to the articular surfaces (scuffing) secondary to arthroscopic manipulation may be the most common unrecognized complication⁷, and WESTESSON et al., reported an incidence up to 50% of scuffing in fresh cadaver studies of patients having undergone TMJ arthroscopy¹³.

AV fistula is a high-flow vascular lesion that directly communicates the high arterial flow with the slow venous circulation. This high pressure produces a dilation of the weak wall of the venous vessels resulting in a mass with a palpable thrill and an audible bruit. The suspected mechanism for AVF after TMJ arthroscopy could be a blunt or sharp



Fig. 4. Panoramic radiograph after treatment of the fistula. Radioopaque coils used for embolization can be observed on the right TMJ area.

trauma that connects the superficial temporal artery with the rich vascular venous pterygoid plexus. Therefore, an enlargement of the external carotid system, secondary to different blood pressures between arterial and venous circulation, can be expected. These findings have been described in all cases reported in the literature^{2,3,8,9,11}. A careful arthroscopic technique is mandatory to avoid such complication⁷.

Therapy of AVF must include a previous study of the affected vascular territory in order to make an appropriate treatment planning. Nowadays, non-invasive imaging tests such as CT-angiography⁵ and MR-angiography¹⁰ are valid options, although the low-morbidity superselective arteriography is the most complete test. Treatment options include surgical ligation of the vessels⁸, excision of the fistula, and arterial embolization whether alone^{3,11} or followed by surgical resection⁹. CALWELL et al., reported a case where an initial attempt of surgical ligation resulted in a recurrence and required a subsequent arterial embolization². Although superselective catheter-

ization of the external carotid artery is not without inherent risks, seems to be the treatment of choice¹. The present case was successfully treated using this low-morbidity procedure.

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