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TREATMENT OF ARTERIOVENOUS MALFORMATION OF THE FACE ASSOCIATING RESECTION AND MODIFIED AUERSVALD HEMOSTATIC NET

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Abstract: INTRODUCTION: The treatment of arteriovenous malformations (AVM) in the face is complex due to the high rate of recurrence and complications related to functional and aesthetic impairment. This article describes the treatment of an AVM in the supra-orbital and frontal region, combining resection and modified Auersvald hemostatic mesh in a 23-year-old patient. CASE REPORT: ACSP patient, female, 23 years old, with a pulsatile reddish mass involving the supra orbital, left frontal region of progressive growth, whose initial presentation was a congenital red spot in the same topography. After embolization was contraindicated due to the risk of brain damage such as amaurosis, we opted for surgical treatment combining partial resection of the lesion through coronal access with skin preservation followed by the use of a modified Auersvald hemostatic network. RESULT: The patient maintained the use of the hemostatic network for 2 months after surgical resection. A progressive decrease in the volume of the lesion was observed. The skin involved in the lesion remained well perfused, progressing with a progressive improvement in its appearance. There was no damage to the frontal branch of the facial nerve. DISCUSSION: AVMs have the ability to infiltrate noble structures, causing serious functional consequences. The objectives of surgery are based on the maximum possible resection of the tumor mass, maintaining the function of the affected area and avoiding complications, such as injury to adjacent nerves, bleeding and ischemia. Repetition and reinterventions are frequent, making these conditions a challenge for our specialty. CONCLUSION: The treatment of AVMs on the face combining resection and the use of a modified Auersvald hemostatic mesh presents itself as an option in the treatment of lesions that do not respond to embolization or that present a prohibitive risk.

Keywords: Surgical treatment; arteriovenous malformation; Face.

INTRODUCTION

Arteriovenous malformations, despite being the least prevalent vascular malformations, represent a pathology that requires challenging treatment.

Treatment requires a multidisciplinary approach, especially when the lesions are related to noble vessels and are located adjacent to structures whose resection is unfeasible from an aesthetic and functional point of view. (1) Vascular malformations, unlike hemangiomas, do not regress spontaneously. (1) Malformations are remnants of embryonic tissue that progress slowly throughout life. Vascular, venous and lymphatic malformations have a predilection for the lower limbs, followed by the head and neck. Arteriovenous malformations (AVM), although less prevalent, have the most frequent clinical presentation involving the involvement of multiple body segments, followed by involvement of the head and neck and the lower limb. (3). Despite the fact that more than 90% of vascular malformations are present at birth. (7) its diagnosis may only occur in adulthood. Diagnosis before the age of 20 is made by observing a change in skin color. Its incidence is equal in both sexes. Ultrasound shows hypoechogenic vascular channels without a well-defined mass. The fast flow pattern is associated with pulsatile flow in the outflow vein. There is high flow and high resistance in the dilated draining arteries and veins and the wave is arterialized (monophasic). Venous flow is pulsatile. It is possible to recognize the number of outflow veins and their morphology (5). Conventional angiography is essential for planning, treatment extension, dynamic assessment and vascular anatomy. (3) The pathognomonic finding is dilated afferent arteries with early opacification of the dilated efferent veins. Angiography allows the distinction of 4 AVM subtypes. (7). The therapeutic approach must be early to prevent the lesions from acquiring destructive and infiltrative characteristics. Endovascular embolization is the therapy of choice. Surgery and embolization are generally combined for extensive lesions. (6) The approach depends on the extent of the lesion, location and functional impairment. Surgery is reserved when embolization is unsuccessful. Surgical difficulty is related to the hemorrhagic risk and poor visualization of the limits, as well as the involvement of larger structures.

REPORT OF CASE

ACSP patient, female, 23 years old, with a pulsatile reddish mass involving the supraorbital and left frontal regions of progressive growth, whose initial presentation was a congenital red spot in the same topography. On physical examination, a mass was observed in the left frontal region measuring 4cm x 5cm in its largest diameters, compressive with ill-defined limits, pulsatile and painful on palpation. The lesion was submitted to an imaging study using Doppler ultrasound, which revealed serpiginous tubular structures measuring 0.3 cm in diameter, 3.7 cm in its largest diameter and 0.9 cm in depth located in the frontal region. Magnetic resonance angiography showed: a tangle of tortuous ectatic vessels located in the frontal region presenting high flow, with the ophthalmic artery measuring 3.2 x 1.3 x 4.0 cm.

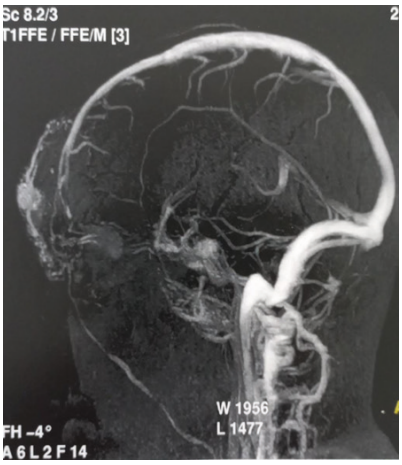

Figure 1 - MR angiography

After joint evaluation with interventional radiology, it was decided not to embolize the lesion due to the risk of compromising the ophthalmic artery and consequent amaurosis. The patient underwent four sessions of intralesional injection of vascular sclerosants: glucocorticoids and ethamolin®, over a period of 4 months, but without significant clinical response. Two months after completion of local sclerotherapy, it was decided to undergo surgical treatment combining partial resection of the lesion through coronal access with skin preservation followed by the use of an Aursvald hemostatic mesh.

RESULTS

The patient remained with the Aursvald hemostatic mesh for 2 months after AVM resection. A progressive decrease in the volume of the lesion was observed. The skin involved in the lesion remained well perfused, progressing with a progressive improvement in its appearance. There was no damage to the frontal branch of the facial nerve. Three months after resection, the region was studied again with Doppler ultrasound and observed: hypoechoic areas of a fibroscar nature where, previously, serpiginous tubular structures were found. Presence of small caliber vessels in the left supraorbital region.

Figure 2 and 3 - Frontal injury; Pre-operative.

Figure 4 - One week post-operatively using a hemostatic mesh

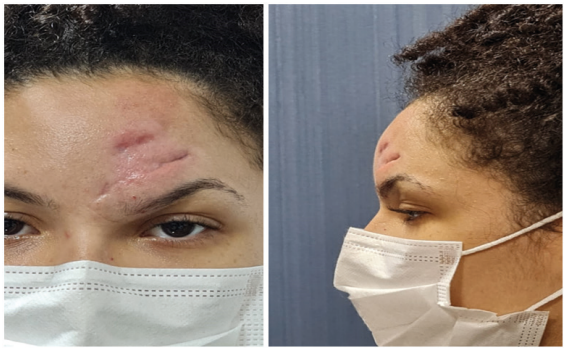

Figure 5 and 6 - Three months after resection

Figure 7 and 8 - Six months after resection

DISCUSSION

Arteriovenous malformations (AVM) originate from direct artery-to-vein communications lacking a capillary bed, with the artery and vein directly connected by a fistula or indirectly connected by a set of abnormal bridging vessels, called nests. (3)

AVMs have the ability to infiltrate noble structures, causing serious functional consequences. Therefore, it is essential to establish a timely diagnosis based on a detailed clinical history and thorough physical examination. The imaging study must be performed using Doppler ultrasound and magnetic resonance imaging. Angiography and CT angiography are indicated in cases where endovascular treatment is necessary. (4)

A clinical staging system, presented by Schobinger in 1990, is useful for documenting the presentation and evolution of an AVM. Stage I (quiescence): bluish-pink stain, heat and arteriovenous effusion by Doppler study. Stage II (Expansion): the same as stage I, it adds enlargement, pulsation in addition to tortuous and tense veins. Stage III: same as stage II, adds dystrophic skin changes, ulceration, tissue necrosis, bleeding or persistent pain. Stage IV: same as stage III, plus heart failure (decompensation). (7). Treatment is complex due to the need to maintain function and the high rate of complications. The mainstays of treatment are based on embolization, sclerotherapy, surgical resection and reconstruction. Proximal ligation or embolization of the feeding vessels is contraindicated; these maneuvers block access to embolization and result in the rapid recruitment of new vessels from adjacent arteries that will feed the nest. Embolization provides only transient improvements due to the recruitment of new vessels by the nest. (6)

The objectives of surgery are based on the maximum possible resection of the tumor mass, maintaining the function of the affected area and avoiding complications, such as injury to adjacent nerves, bleeding and ischemia.

Repetition and reinterventions are frequent, making these conditions a challenge for our specialty. Complete resection is often not possible or can generate unacceptable morphological and functional changes. In these cases, embolization or sclerotherapy may be used to control symptoms such as pain, bleeding, or congestive heart failure. (3)

Treatment depends on the type of vascular malformation, location and extent of the lesion and growth dynamics. The different options include: cryotherapy, use of corticosteroids, interferon-a9-2a, laser therapy, sclerotherapy, embolization and surgery. (1)

In AVMs, the only curative treatment is total resection of the lesion, which is often not possible due to its extension. Embolization is one of the most used options, especially for injuries with a high risk of bleeding7. This is used both as a preoperative treatment before surgical resection, and also as a single treatment, applied palliatively to patients without indication for resection8. We must emphasize that the persistence of the vascular anomaly is the rule. This is a fact that deserves important consideration when it comes to preoperative planning and future interventions. (5)

Surgical resection and concomitant embolization are the most successful therapeutic option for well-localized stage I or II malformations. (two)

The indication for resection must be taken carefully by the interdisciplinary team, assessing the risk of functional sequelae that may result from the surgery. Clinical and imaging follow-up (using ultrasound and/or magnetic resonance imaging) is necessary for several years. Experienced surgeons recognize that a "cure" can only be assessed after a long

period of time, since the chances of recurrence are high. Unfortunately, many AVMs are not localized, presenting an invasive pattern that infiltrates all tissue planes. (4).

CONCLUSION

The treatment of AVMs on the face, combining resection and the use of an Aursvald hemostatic mesh, presents itself as an option in the treatment of lesions for which embolization and/or complete resection are unfeasible due to their damage to the function and aesthetics of the structures adjacent to the lesion.

REFERENCES

1. Lee, B.-B., Laredo, J., and Neville, R.F. (2015). **Clinical Aspects in Vascular Malformations**., In: Mattassi, R., Loose, D.A., and Vaghi, M. Eds. Hemangiomas and Vascular Malformations. Milano: Springer Milan, 189–197.

2. Lee, B.B., Baumgartner, I., Berlien, H.P., Bianchini, G., et al. (2013). **Consensus Document of the International Union of Angiology** (IUA)-2013. Current concept on the management of arteriovenous management. Int. Angiol. J. Int. Union Angiol. 32:9–36.

3. Marler JJ, Mulliken JB. **Current management of hemangiomas and vascular malformations**. Clin Plast Surg. 2005;32(1):99-116.

4. Lee, B.-B., Laredo, J., Neville, R.F., Kim, Y.-W., et al. (2015). **Epidemiology of Vascular Malformations**., In: Mattassi, R., Loose, D.A., and Vaghi, M. Eds. Hemangiomas and Vascular Malformations. Milano: Springer Milan, 165–169.

5. ANOLIK, R. et al. Investigation into optimal treatment intervals of facial port-wine stains using the pulsed dye laser. **Journal of the American Academy of Dermatology**, v. 67, n. 5, p. 985–990, nov. 2012.

6. TANG, P. et al. Surgical Treatment of Hemangiomas of Soft Tissue. **Clinical Orthopaedics and Related Research**, v. 399, p. 205–210, jun. 2002.

7. **Trastornos vasculares**. In: Green DP, Hotchkiss RN. Cirugia de la mano. New York: Marban; 2007.

8. Mulliken JB. **Vascular anomalies**. In: Aston SJ, Beasley RW, Thorne CHM, eds. Grabb and Smith's plastic surgery. Philadelphia: Lippincott-Raven; 1997. p. 191-204.