

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/radcr

Case Report

Presurgical embolization of nasopharyngeal fibroma: A case report[☆]

Moustapha Diallo, MD^{a,*}, Abdoulaye Dione Diop, PhD^b, Cheikh Ahmedou Lame, MD^c, Cheikhna Ba Ndiaye, MD^c, Ndeye Isseu Amar, MD^a, Mame Diarra Bousso Ndaw, MD^a, Aminata Diack, MD^a, Ababacar Mbengue, PhD^a, Abdoulaye Ndoeye Diop, PhD^d

^a Medical Imaging Department, Dakar Main Hospital, Dakar, Senegal

^b Medical Imaging Department, Fann University Hospital, Dakar, Senegal

^c Department of Head and Neck Surgery, Dakar Main Hospital, Dakar, Senegal

^d Gaston Berger University, Saint Louis, Dakar, Senegal

ARTICLE INFO

Article history:

Received 20 November 2023

Revised 25 November 2023

Accepted 27 November 2023

Keywords:

Nasopharyngeal fibroma

Presurgical embolization

Resorbable gelatin

ABSTRACT

Nasopharyngeal fibroma (NF) is a rare nasopharyngeal tumor of a benign histological nature but with local aggressiveness. It is a hypervascular tumor and the main feeding artery comes from the internal maxillary artery. Surgery is the treatment of choice for this tumor but carries a significant risk of bleeding from surgical treatment. Thus, embolization carried out preoperatively effectively reduces intraoperative bleeding and thereby allows complete resection for large tumors.

© 2023 The Authors. Published by Elsevier Inc. on behalf of University of Washington.

This is an open access article under the CC BY-NC-ND license

(<http://creativecommons.org/licenses/by-nc-nd/4.0/>)

Introduction

The nasopharyngeal fibroma (NF) is a rare nasopharyngeal tumor that mainly affects adolescent males [1,2]. Despite a benign histological appearance, this tumor is highly aggressive and can spread locally [2].

It is a hypervascular tumor and the main feeding artery comes from the internal maxillary artery [3]. Surgery is the treatment of choice for this tumor but carries a significant risk of bleeding during biopsy and surgical treatment. Embolization performed during angiography makes it possible to reduce intraoperative bleeding and thereby achieve complete

resection for large tumors [4]. Thus, we report the case of a nasopharyngeal fibroma, treated by surgery after preoperative embolization which allowed complete resection. We will also highlight the advantages induced by this embolization.

Observation

This case revolves around a 72-year-old patient who presented with a unilateral endonasal mass that had been evolving for 35 years. The mass was responsible for nasal obstruction, hyposmia, recurrent epistaxis, and headaches. On endoscopic

[☆] Competing Interests: The authors have declared that no competing interests exist.

* Corresponding author.

E-mail address: daddykr@hotmail.com (M. Diallo).

<https://doi.org/10.1016/j.radcr.2023.11.066>

1930-0433/© 2023 The Authors. Published by Elsevier Inc. on behalf of University of Washington. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>)

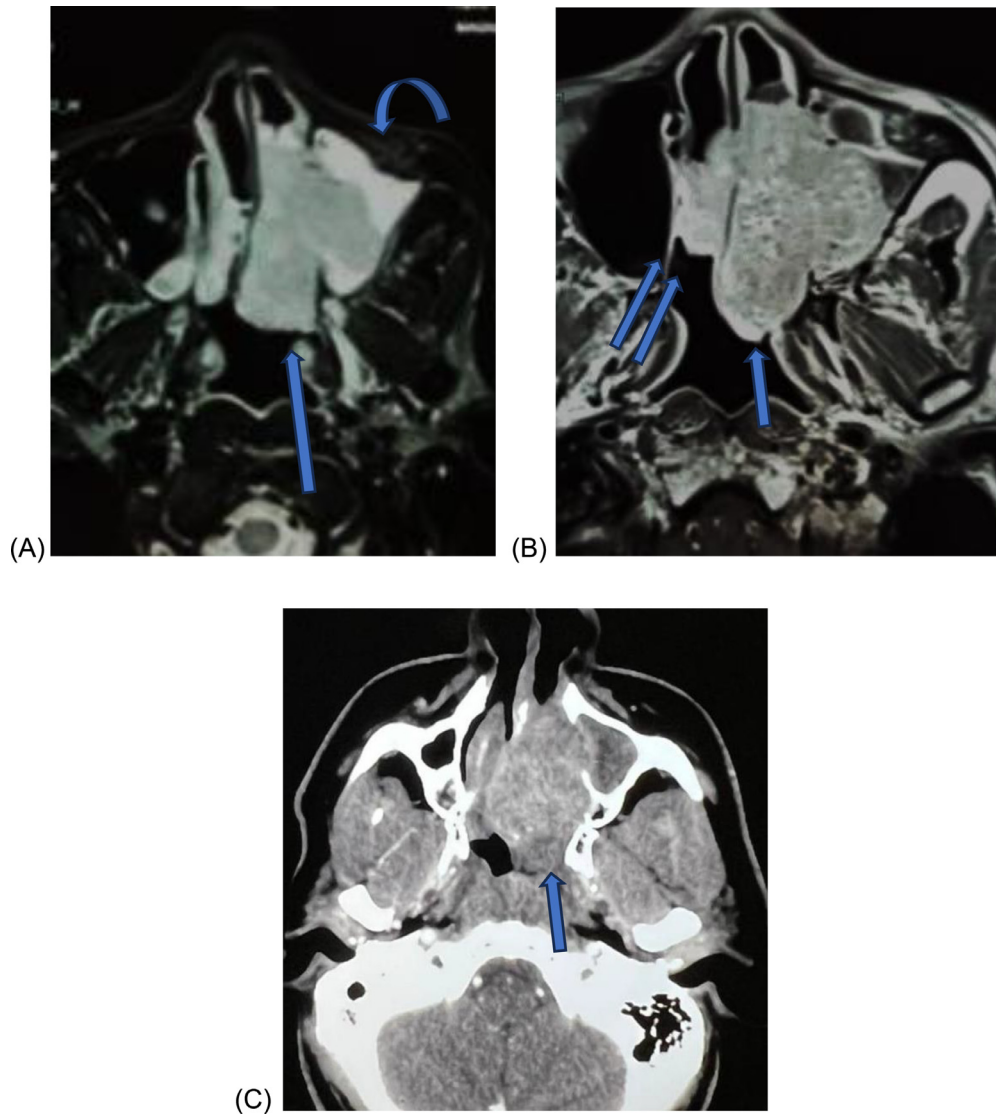


Fig. 1 – MRI and CT of the facial: axial T2-weighted sections with fat suppression (A), T1-weighted images with fat suppression and gadolinium injection (B), and axial CT section after injection: Left endonasal mass in T2 hypersignal and intensely enhanced after injection (short arrow), extending towards the nasopharynx and with a maxillary intrasinus component. Note the inflammatory retention in the left maxillary sinus (curved arrow) and the extension to the right nasal cavity (double arrow).

examination, it was budding, reddish in appearance, bleeding on contact, and obstructing almost the entire endonasal canal. The cross-sectional imaging examinations carried out in addition (CT angiography and MRI angiography) found a left endonasal and maxillary sinus tissue mass, hypervascular in nature and extending posteriorly towards the nasopharynx and laterally toward the right nasal cavity (Fig. 1). The appearance was suggestive of nasopharyngeal angiofibroma. Surgical excision was indicated after preoperative embolization to minimize intraoperative bleeding. The embolization was carried out in a multipurpose angiography room with a General Electric Optima IGS 330 brand monoplane table. The patient was placed in a supine position then under strict aseptic conditions, a right femoral vascular access was performed using the Seldinger method followed by the installation of a 05 French

valve introducer. Catheterization of the external carotid arteries was carried out using a cobra probe carried on a 0.035 hydrophilic guide. The injection of contrast product showed hypervascularization with a brush in the nasal regions, more marked on the left, supplied by the internal maxillary arteries. We therefore carried out selective catheterization of the latter using a microcatheter followed by their embolization with resorbable gelatin (Fig. 2).

Angiographic controls at the end of the procedure were satisfactory with the disappearance of intranasal tumor parenchymography. The patient was operated on 24 hours after embolization without significant intraoperative blood spottiation allowing complete excision of the tumor (Fig. 3). The anatomic-pathological examination confirmed the diagnosis of NF.

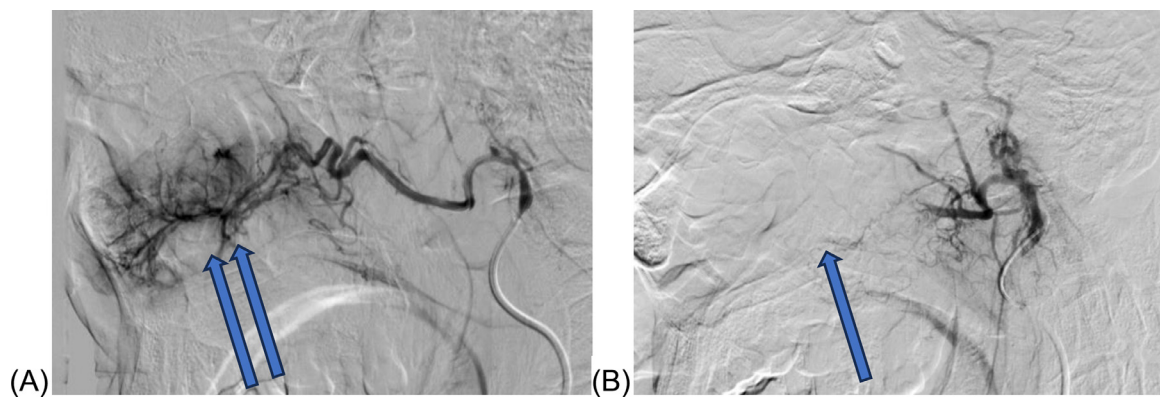


Fig. 2 – Subtraction angiography of the left internal maxillary artery: tumor blush projecting from the nasal cavity (double arrow), disappearing after embolization (single arrow).



Fig. 3 – Surgical specimens after complete excision showing partial devascularization of the FNP.

Comments

Nasopharyngeal fibroma (NF) is a rare tumor of the nasopharynx representing approximately 0.05%-0.5% of all head and neck tumors [5]. It is a histologically benign tumor, locally aggressive and very vascular [6]. It usually affects adolescent males between the ages of 7 and 25 [4]. The insidious development of this tumor and the gradual onset of these symptoms explain the late diagnosis. Our patient's tumor had been evolving for more than 35 years but the late diagnosis can also be explained by a delay in consultation. Rhinological signs are in the foreground and dominated by unilateral or bilateral nasal obstruction found in 79%-87% of cases [6] and this was the case in our patient. Computed tomography and magnetic resonance imaging make it possible to discuss the diagnosis and make an assessment of the extension, thus constituting an important step in the choice of the surgical technique to be deployed [5] but MRI allows a better evaluation of the tumor extension, particularly towards deep spaces. It also makes it possible to distinguish between sinus invasion and retention. The FNP appears as a mass with discrete hyposignal on T1 and hypersignal on T2 with intense enhancement

after Gadolinium injection [2–7]. The MRI in our case revealed the same characteristics with extension to the nasopharynx, the nasal cavity, and mucous retention in the left maxillary sinus. In most cases, a biopsy is not necessary before resection. If the appearance is not typical or if the clinical presentation is not usual, a biopsy must be performed before excision preferably in the operating room [8]. Indeed, the differential diagnosis can sometimes be made with fibrous dysplasia, lymphoepithelioma, and rhabdomyosarcoma [8].

Surgical excision is the most effective treatment for NF albeit alternative treatments exist such as radiotherapy and hormonal therapy [9].

However, surgical excision may face a significant risk of massive intraoperative hemorrhage due to the vascular fragility of the NF. The influx of blood usually makes the surgical exposure unclear and the excision incomplete and sometimes it turns to life-threatening hemorrhage [3].

Thus, preoperative devascularization by embolization of the feeding arteries is one of the strategies to reduce intraoperative hemorrhage. It was first identified in 1970 as an adjuvant treatment for NF [9]. It is an effective and minimally invasive technique [3] whose aim is to obliterate the arteries feeding the tumor. The examination includes a profile study

using a 4- or 5-French catheter placed in the external carotid artery. Angiography initially allows an assessment of the arteries participating in the blood supply, mainly made up of the internal maxillary artery. Other branches such as the facial artery and the ascending pharyngeal artery may participate in the blood supply [3]. In case of contralateral extension, a study of the vessels on the opposite side is carried out. The embolization of the main artery is sufficient in most cases for more than 80% devascularization even if secondary arteries are involved. In our case under study, the tumor was mainly vascularized by the left internal maxillary artery. The opposite side was studied and did not show significant tumor blush. Despite this, a principal embolization was carried out. Several embolic agents can be used, such as absorbable gelatin, polyvinyl alcohol, microcoils, and liquid agents [3]. The choice of agents depends on several factors, including ease of administration, durability of occlusion, and local availability of the embolization agent. Gelatin is the ideal agent for temporary occlusion of 24-48 hours in the context of preoperative embolization. We used absorbable gelatin particles because it is the most available and the most accessible agent in terms of cost in our practice conditions and the desired effect was a temporary embolization of 24 hours.

Preoperative embolization reduces intraoperative blood loss, the duration of the surgical procedure, and a more complete excision. Renguang et al. [3], in their comparative study, found an average volume of blood loss of 353 mL in patients who had preoperative embolization compared to 1215 mL in patients without preoperative embolization with a shorter duration of intervention. Li et al. [10], found much less intraoperative bleeding in the intraoperative embolization group than those who did not benefit from embolization (on average 637 mL compared to 1136 mL). Blood loss was not assessed during our patient's procedure. However, surgeons reported little blood loss with a clear operating field during the procedure. This allowed complete excision of the tumor. Postembolization syndromes such as fever or local pain can be seen 12-24 hours after embolization and is treated with steroids. Transient bradycardia can occur during injection of the maxilla, or less frequently the ascending pharyngeal, and it can be treated by intravenous atropine injection [9–11], Upper or lower dental pain or anesthesia of the perioral integuments and in the V2 territory can be seen for a week after embolization.

The major complications boil down to the use of inadequate embolization material, its reflux in the event of spasm or nonselective catheterization, and the failure to identify dangerous anastomoses.

Our patient's postembolization outcomes were simple, without minor or major complications.

Conclusion

The preoperative embolization of nasopharyngeal fibroma is a safe and effective technique, making it possible to improve the surgical conditions of this tumor. It significantly reduces intraoperative blood loss and thus leads to complete excision.

Patient consent

The patient has signed a free and informed consent to the anonymous publication of the material contained in this article.

REFERENCES

- [1] Cansiz H, Güvenç MG, Sekercioglu N. Surgical approaches to juvenile nasopharyngeal angiofibroma. *J Craniomaxillofac Surg* 2006;34:3–8.
- [2] Paris J, Guelfucci B, Moulin G, Zanar et M, Triglia JM. Diagnosis and treatment of juvenile nasopharyngeal angiofibroma. *Eur Arch Otorhinolaryngol* 2001;258:120–4.
- [3] Renguang P, Min Y, Jian W, Xiaoqiang T, Guoxiang W, Yinghua Z. Efficacy and safety of preoperative internal maxillary arterial embolization with gelfoam for nasopharyngeal angiofibroma. *Eur Arch Otorhinolaryngol* 2019;276:865–9.
- [4] Oueslati O, Gamra OB, Kharrat S, Sassi S, Milka N, Rajhi H, et al. Le fibrome nasopharyngien: à propos de 15 cas traités par embolisation. *J Radiol* 2008;89:579–84.
- [5] Celik B, Erisen L, Saraydaroglu O, Coskun H. Atypical angiofibromas: a report of four cases. *Int J Pediatr otorhinolaryngol* 2005;69:415–21.
- [6] Roberson GH, Price AC, Davis JM, Gulati A. Therapeutic embolization of juvenile angiofibroma. *AJR Am J Roentgenol* 1979;133:657–63.
- [7] Davis KR. Embolization of epistaxis and Juvenile nasopharyngeal angiofibromas. *AJR Am J Roentgenol* 1987;148:209–18.
- [8] D Radkowski, McGill T, Healy GB, Ohlms L, Angiofibroma Jones DT. Changes in staging and treatment. *Arch Otolaryngol Head Neck Surg* 1996;122:122–9.
- [9] Roberson GH, Biller H, Sessions DG, Ogura JH. Prechirurgical internal maxillary artery embolization of a juvenile angiofibroma. *Laryngoscope* 1972;82:1524–32.
- [10] Li JR, Qian J, Shan XZ, Wang L. Evaluation of the effectiveness of preoperative embolization in surgery for nasopharyngeal angiofibroma. *Eur Arch Otolaryngol* 1998;255:430–2.
- [11] Lasjaunias P. Nasopharyngeal angiofibromas: hazards of embolization. *Radiology* 1980;136:119–23.