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Endoscopic approach of the pterygopalatine fossa: Report of one case*

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SUMMARY

We report one case of schwannoma of the pterygopalatine fossa. The pre-operative management and post-operative follow-up are presented. For this uncommon localization, we propose an endoscopic approach via the nasal fossa and the maxillary sinus. The advantages and limitations of this technique are discussed.

Key words: endoscopy, pterygopalatine fossa, schwannoma

INTRODUCTION

We report one case of benign schwannoma of the pterygopalatine fossa with an original approach for its surgical treatment. Schwannomas of the paranasal sinus are rare (Piquet et al., 1977; Younis et al., 1991). The diagnosis is frequently made late and the symptomatology depends on the localization (Robitaille et al., 1975). Radiology and endoscopy are useful to locate and determine the extension of these tumours (Mancuso et al., 1989; Pasic and Makielski, 1990). In this case, we performed an unusual endonasal removal, under endoscopic guidance. We describe and debate this technique.

CASE REPORT

A 57-year-old woman complained of a right headache. She had no neurological or previous ENT pathologies. The neurological examination was normal, but due to persistance of symptoms, a CT scan was performed. A heterogeneous well-demarcated opacity located in the pterygopalatine fossa (Figure 1) was demonstrated. The maxillary sinuses were asymmetric, due to anterior displacement of the posterior sinus wall. During physical examination, an impaired sensation in the distribution of the right infra-orbital nerve was found. Endonasal endoscopy revealed a convexity of the infero-posterior part of the right middle meatus beneath the bulla ethmoidalis. The mucous membrane was normal. MRI confirmed a retro-maxillary well-limited tumour without obvious extension into adjacent areas (Figure 2). The tumour appeared to be delineated by a thin pseudo-capsule. Because of these features we decided to perform an endonasal approach under endoscopic guidance in order to take a biopsy, and eventually to remove the tumour. Notice of an external approach via the fossa canina was given to the patient. A middle meatal antrostomy was performed to reach the posterior wall of the maxillary sinus. As shown on the CT scan this bone was thin and could easily be opened, its partial removal uncovered the tumour capsule. The tumour was opened under endoscopic control and its contents totally sucked out. At the end of the procedure the tumour was completly removed. The cavity was perfectly limited posteriorly by the capsule which separated the tumour from the inflammatory reaction tissue of the pterygopalatine fossa. Biopsy of this capsule performed during the procedure confirmed the complete excision of the tumour. Histological findings of the tumour confirmed the diagnosis of a schwannoma type A Antoni (JMG). We observed a recovery of infra-orbital sensivity, some hours following the surgery. The cicatrisation was controlled with endoscopic examination, and biopsies of the post-operative cavity (at days 42 and 100) revealed a fibrous inflammatory reaction without tumour tissue. A CT scan and MRI performed eight weeks later, demonstrated a soft-tissue density in combination with inflammatory tissue (confirmed after biopsy of the tumour capsule), surrounding the post-operative cavity (Figure 3). The patient was a-symptomatic and further endoscopic examination did not reveal recurrence in this region.

DISCUSSION

Epidemiology

Nasal and paranasal localizations of schwannomas are rare. Conley and Janecka (1975) reported eight cases out of 90 head-and-neck schwannomas. Piquet et al. (1977) described 20 cases out of 17,000 patients (for all ENT pathologies) between 1960 and 1975 with only one ethmoidal localization. Other authors also described some isolated nasal or paranasal schwannomas:

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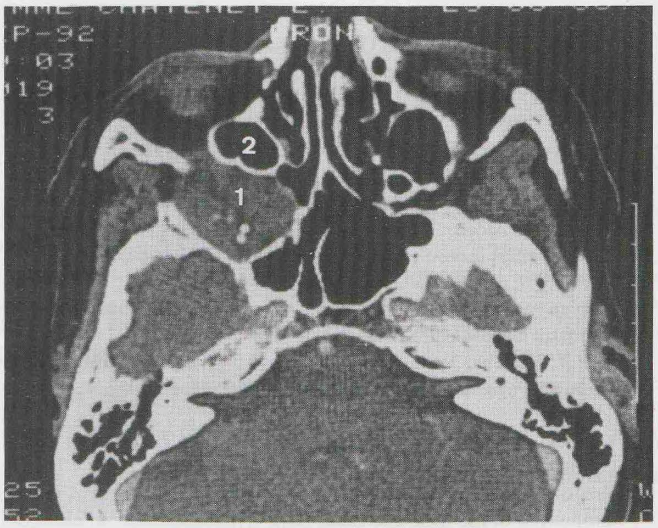

Figure 1. CT scan, axial view. The tumour (1) is located behind the maxillary sinus (2) and is well limited and heterogeneous.

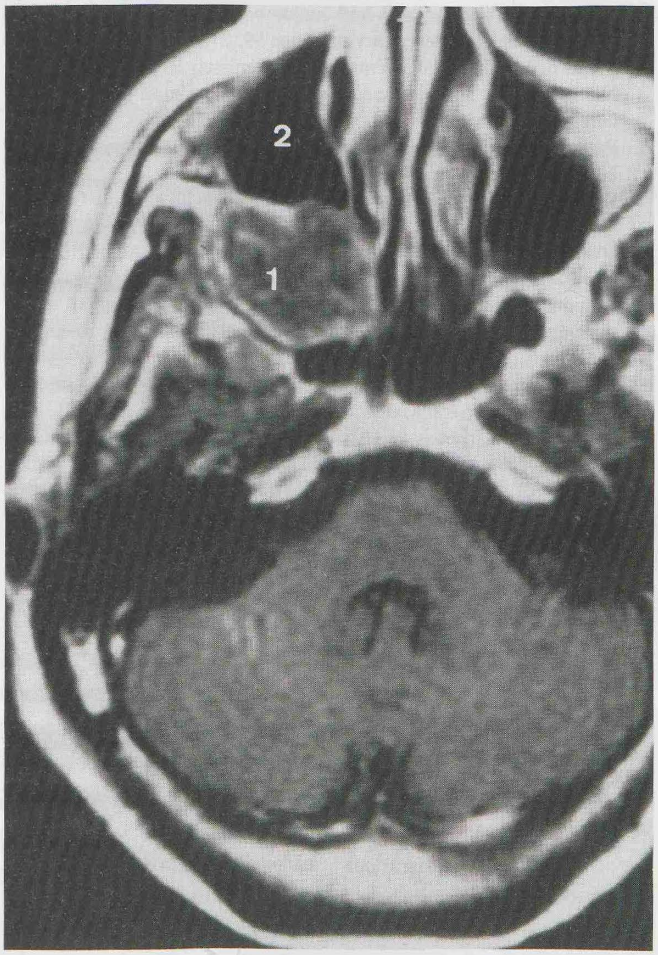

Figure 2. MRI, axial view. The tumour (1) appears well limited and surrounded by a thin capsule. This aspect allowed us to propose a functional approach to remove it. The thinness of the posterior maxillary wall (2) confirmed this choice.

Annino et al. (1991), Pasic and Makielski (1990), Yusuf et al. (1989), Ross et al. (1988), Stevens and Kirkham (1988), Menard et al. (1990). The pterygopalatine fossa is a very uncommon site; the previous cases reported were located in the infratemporal fossa with an antero-lateral extension (Kragh et al., 1960; Gaillard et al., 1984; Iwai et al., 1988; Menard et al., 1990).

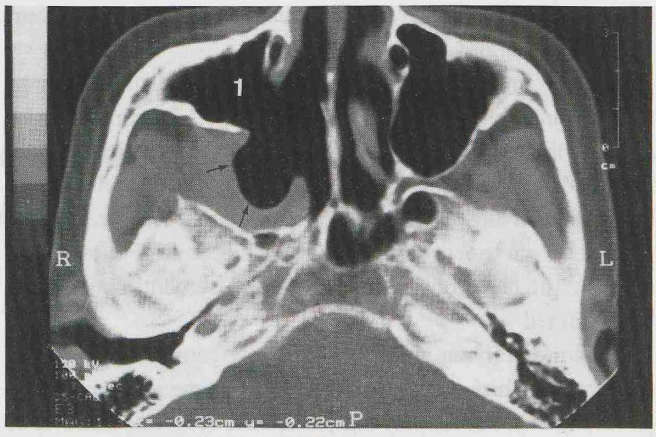

Figure 3. CT scan, axial view. Post-operative (day 56) aspect; the middle antrostomy is widely opened to give access to the posterior maxillary wall (1) which has been partly removed. The post-operative cavity is well limited by the post-operative capsule (black thin arrows), the biopsies of which revealed fibrous cicatricial tissue.

Symptomatology

The symptomatolgy depends on the size and the localization of the tumour. Sometimes, compression of adjacent structures may produce symptoms. In our case, the infra-orbital paresis suggested a direct origin, invasion or compression of the nerve; cephalalgia in return is not specific. Hypotrophy of the homolateral maxillary sinus is in favour of a probably old tumour with slow growth. The lack of specific clinical features goes some way to explain the delay in diagnosis (Piquet et al., 1977; Ross et al, 1988; Iwai et al., 1988; Younis et al., 1991; Annino et al, 1991). Radiology helps to determine the extension and connection of the tumour. On CT scans the schwannoma is well limited, although it may be associated with bone resorption (Younis et al., 1991). An heterogeneous appearance is possible, and this has been ascribed to necrotic or cystic regions (Ross et al., 1988). MRI is necessary to determine more precisely the extension of the tumour. It also allows differentiation between the tumour and the inflammatory reaction. With this examination, the capsule of the tumour is visible in the form of a thin border (Figure 2).

Treatment

Treatment is surgical. On account of the size and the localization, an external approach is usually proposed (Gaillard et al., 1984; Iwai et al., 1988). Nevertheless, in the last few years, endonasal surgery has mostly been prefered each time it seemed possible (Klossek et al., 1992).

In our case, an external approach via the canine fossa was interesting as it offered ample and direct access to the maxillary posterior wall as well as easy removal. A direct view of the operation area and the possibility to keep "both hands free" to control ablation of the tumour were the principal advantages of this choice. Nevertheless, we have preferred an endonasal approach on account of: (1) the well-limited character of the tumour; (2) the absence of vascular features (MRI, CT); and (3) the accessibility via the middle meatus. The principal problems were: (1) the difficulty to remove the posterior wall of the maxil-

lary sinus; (2) to control the complete ablation of the tumour; and (3) the risk of vascular injury.

As for the first point, the thinning of this wall facilitated its opening and ablation with a "punch forceps." To compare with favourable case, anatomical dissections were carried out. In three cadaver specimens we estimated the resistance of this posterior wall. In all specimens we were able to open the pterygopalatine fossa after careful drilling of the bone. Following its ablation, the pterygopalatine fossa and its elements could easily be examined.

The second problem was the risk of an incomplete removal of the tumour, which would lead to a rapid and massive recurrence (Desaulty et al., 1991). For our patient the complete removal of the tumour up to its capsule under endoscopic control (25° and 70°) prevented such an eventuality. To confirm this information we controlled the good quality of the resection with biopsies (at days 42 and 100) of the post-operative capsule which revealed a fibrous cicatricial tissue.

The third risk of this approach is injury of the sphenopalatine artery (Chandler and Serrins, 1965; Maniglia, 1989). In our case, it was protected by the wall of the tumour. In such eventuality via this approach, we performed a ligation of the maxillary artery during the dissection.

Being aware of these difficulties, we have preferred this approach for two reasons. Firstly, its non-traumatic character: the patient may leave the hospital the day after the surgical operation without pain or oedema. Furthermore, our patient recovered right infra-orbital sensitivity some hours following the procedure. The second advantage is the possibility of a direct endoscopic examination to biopsy the post-operative cavity wall to confirm complete tumour removal. If a recurrence appears, its ablation might be easy through the middle meatus eventually after a widening of the opening of the posterior maxillary wall.

CONCLUSION

It seems that progress of the endonasal endoscopic surgery and radiology must favour the expansion of this non-traumatic technique for taking biopsy and surgical treatment of certain benign retromaxillary tumours (Younis et al., 1991).

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REFERENCES

1. Annino DJ, Domanowski GF, Vaughan CW (1991) A rare cause of nasal obstruction, a solitary neurofibroma. Otolaryngol Head Neck Surg 104: 484–488.
2. Conley J, Janecka IP (1975) Neurilemmoma of the head and neck. Trans Am Acad Ophtalmol Otolaryngol 24: 751–796.
3. Chandler JR, Serrins AJ (1965) Transantral ligation of the internal maxillary artery for epistaxis. Laryngoscope 75: 1151–1159.
4. Desaulty A, Moreau L, Vermersch E, Apap E, Lansiaux V (1991) Les schwannomes du cou et de la base du crane. Cahiers d'ORL 21: 5–21.
5. Gaillard A, Sapanet M, Denis M (1984) Schwannome de la fosse ptérygo-maxillaire: Exérese par voie transmandibulaire. Rev Stomatol Chir Maxillo-Fac 5: 63–65.
6. Iwai Y, Hakuba, Noguchi K, Nishimura S (1988) A gigantic neurilemmoma originating in the pterygopalatine fossa. Surg Neurol 30: 452–456.
7. Klossek JM, Fontanel JP (1992) Chirurgie Endonasale sous Guidage Endoscopique. Masson Editions, Paris.
8. Kragh LV, Soule EH, Masson JK (1960) Benign and malignat neurilemmomas of the head and neck. Surg Gynecol Obstet 11: 211–218.
9. Mancuso AA, Harnsberger HR, Dilon WP (1989) Workbook for MRI and CT of the Head and Neck, 2nd Edition. Williams and Wilkins, Baltimore, pp. 7–10.
10. Maniglia AJ (1989) Fatal and major complications secondary to nasal and sinus surgery. Laryngoscope 99: 276–283.
11. Menard P, Bertrand JC, Franc B, Laudenbach P, Doyon D (1990) Neurilemmone solitaire ancien et bénin de la région ptérygomaxillaire. Rev Stomatol Chir Maxillofac 91: 452–456.
12. Pasic TR, Makielski K (1990) Nasal schwannoma. Otolaryngol Head Neck Surg 103: 943–946.
13. Piquet JJ, Desaulty A, Lefebvre JL, Schultheis D, Decroix G (1977) Les Tumeurs Nerveuses Cervico-Faciales: A Propos de 25 Observations. Schwannomes Cervico-Faciaux. Actualités de Carcinologie Cervicofaciale. Masson Editions, Paris, pp. 36–47.
14. Robitaille Y, Shemayer TA, Eldery A (1975) Peripheral nerve tumours involving paranasal sinuses: A case report and review of the literature. Cancer 35: 1254–1258.
15. Ross C, Wright E, Moseley J, Rees R (1988) Massive schwannoma of the nose and paranasal sinuses. South Med J 81: 1588–1591.
16. Stevens DJ, Kirkham N (1988). Neurofibromas of the paranasal sinuses. J Laryngol Otol 102: 256–259.
17. Younis RT, Gross CW, Lazar RH (1991) Schwannomas of the paranasal sinuses. Case report and clinicopathologic analysis. Arch Otolaryngol Head Neck Surg 117: 677–680.
18. Yusuf H, Fajemisin OA, McWilliam LJ (1989) Neurilemmoma involving the maxillary sinus: A case report. Br J Oral Maxillofac Surg 27: 506–511.

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