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Clinical case

Anterior fossa schwannoma mimicking an olfactory groove meningioma: Case report and literature review

Les schwannomes de la fosse antérieure : un diagnostic différentiel des méningiomes de la gouttière olfactive. À propos d'un cas et revue de la littérature

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ABSTRACT

Intracranial schwannomas not associated with cranial nerves account for less than 1% of surgically treated schwannomas of the central and peripheral nervous system. With only 45 cases reported to date, subfrontal schwannomas are very rare tumors, leaving the issue of their origin controversial. A 66-year-old woman presented with a 1-year history of progressive headaches. Clinical examination revealed hypoesthesia of the nasal tip. CT-scan and MRI studies revealed a large subfrontal tumor thought preoperatively to be a meningioma. Intraoperatively, a large extra-axial tumor arising from the floor of the right frontal fossa was encountered. Histopathology identified the tumor as a schwannoma. This current case gives strong clinical presumption of an origin from the anterior ethmoidal nerve. We reviewed the literature in order to establish the epidemiology of these tumors, from which there appear to be divergent profiles depending on tumor origin and histology. Despite close similarities with olfactory groove meningiomas, patient history and radiological findings provide substantial evidence for differential diagnosis.

Mots clés :
Gouttière olfactive
Schwannome
Nerf nasociliaire

RÉSUMÉ

Les schwannomes intracrâniens non associés aux paires crâniennes représentent moins de 1 % des schwannomes opérés. Avec seulement 45 cas reportés, les schwannomes de la fosse antérieure constituent un groupe rare de tumeur, dont l'origine prête à controverse. Nous reportons le cas d'une patiente de 66 ans aux antécédents de céphalées depuis un an. L'examen clinique ne retrouvait qu'une hypoesthésie unilatérale de la pointe du nez. L'imagerie TDM et IRM ont permis d'identifier une volumineuse tumeur sous-frontale envahissant l'ethmoïde, évoquant un méningiome olfactif. L'analyse anatomopathologique de la pièce opératoire concluait cependant en un schwannome bénin. Ce cas évoque fortement une tumeur originaire du nerf ethmoïdal antérieur. Nous avons réalisé une revue de la littérature dans l'objectif d'établir une épidémiologie de ces tumeurs, qui semblent présenter des profils divergents. En dépit d'une grande similarité avec les méningiomes de la gouttière olfactive, l'histoire clinique et l'imagerie préopératoire offrent de nombreux éléments de différentiation.

1. Introduction

Schwannomas are benign, slowly growing nerve sheath tumors. They account for about 8% of all intracranial tumors and can arise from any nerve containing Schwann cells. The most common location is the vestibular portion of the VIIIth cranial nerve and, less commonly, the Vth, IXth, Xth, and VIIth cranial nerves. The occurrence of a schwannoma not related to cranial nerves is exceedingly rare [1], the most common location being the anterior cranial fossa. To date, only 45 cases without neurofibromatosis disease have been described. Recent histological findings concerning the olfactory

Abbreviations: CD, Cluster of differentiation in human leukocytes; CT-scan, Computerized tomodensitometry scanner; CP, cribriform plate; MRI-scan, Magnetic resonance imaging scanner; OEC, Olfactory ensheathing cells; OECT, Olfactory ensheathing cells tumor; OG, Olfactory groove; OGS, Olfactory groove schwannoma; SBD, Skull base dura; SR, Sex-ratio.

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groove differentiate two kinds of ensheating cells tumor: typical schwannomas (OGS) and olfactory ensheating cells tumors (OECT) [2].

We describe a case of an OGS in a 66-year-old Caucasian woman, preoperatively thought to be an anterior fossa meningioma. Due to their unusual frequency, we review the literature in order to establish the epidemiological profile and pathogenesis of this kind of tumor.

2. Case report

A 66-year-old right-handed Caucasian female having no medical history was admitted to our department for progressive headaches. The neurological examination showed a sensitive defect on the right side of the nasal tip. She had neither anosmia nor gustative disorder. The endonasal examination was normal. There were no skin stigmata of neurofibromatosis, or anomaly of the fundus.

CT-scan revealed a low density mass without calcifications, localized in the basis of the right frontal cranial fossa, eroding the cribriform plate and invading the posterior cells of the ethmoid sinus. A Gadolinium enhanced MR-scan showed a large, homogeneously enhanced extra-cerebral lesion arising from the floor of the right anterior cranial fossa. A small portion of the tumor crossed the midline, deflecting off the falx medially and inferiorly. We observed minimal peritumoral edema and no evidence of a dural tail sign. Preoperatively we evoked a left olfactory groove meningioma (Fig. 1).

Surgery was performed through a right frontal craniotomy. The tumor had a solid hypovascular yellowish-white colored aspect arising from the right olfactory groove. It elevated the right frontal lobe. We were unable to identify the homolateral olfactory bulb. The removal of the intracranial portion of the tumor allowed us to see the contralateral olfactive tract. Despite the invasion of the ethmoid sinus and the bone erosion, the nasal cavity was respected.

A postoperative rapidly regressive cerebral edema occurred. Postoperative evolution was good with no new neurological deficit and complete smelling preservation.

Microscopic examination showed bipolar spindle shaped cells spread into a fibrous texture, evoking the Antoni pattern A. Because of the unusual location, immunostaining was performed. Tumor cells stained highly positive for S100 protein and CD-57 (Leu7) and negative for epithelial membrane antigen, AE1 and AE3 cytokeratin and P63. Ki67 labeling index was negative. The histological examination confirmed the diagnosis of benign schwannoma (Fig. 2).

3. Discussion

Intracranial schwannomas account for approximately 8% of all the intracranial tumors. Most of them arise from the vestibular branch of vestibulocochlear nerve (80–90%). They can also involve trigeminal nerve (8%), facial nerve (1.9%) and, less frequently, other cranial nerves. Despite the high frequency of head and neck

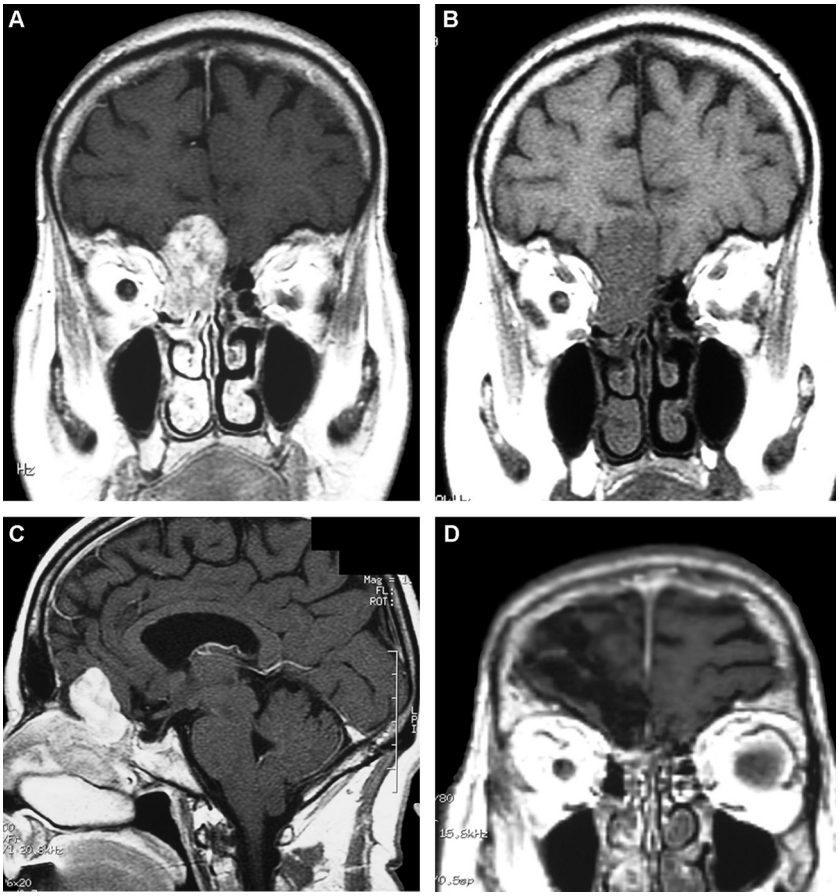

Fig. 1. A. B. Preoperative T1 coronal MRI, showing the ethmoidal sinus extension of the tumor. C. Preoperative T1 weighted free gadolinium sagittal MRI. D. Immediate postoperative view on T1w MR-scan; complete removal.
A. B. IRM préopératoire T1 en coupe coronale, montrant l'extension tumorale au sinus ethmoïdal. C. IRM préopératoire T1 en coupe sagittale. D. IRM T1 postopératoire précoce ne retrouvant pas de reliquat.