Open Journal of Otolaryngology

ISSN: 2639-3603

Volume 3, Issue 2, 2020, PP: 01-04

A Misleading Dark Pigmented Mass of the External Auditory Canal in a Child

S. Ayache*

*Department of Otorhinolaryngology - Head & Neck Surgery, Otology & Neurotology Unit, Hospital Centre Simone Veil, Cannes, France.

***Corresponding Author:** *S. Ayache, Department of Otorhinolaryngology - Head & Neck Surgery, Otology & Neurotology Unit, Hospital Centre Simone Veil, Cannes, France.*

Abstract

Tumors arising in the external auditory canal (EAC) are uncommon. Their dark color has to rule out the diagnosis of melanoma. We report the case of a 10-year old patient presented with a dark pigmented tumor within EAC. Otoscopic examination revealed a black mass arising from the posterior wall of the EAC. Surgical removal of the tumor was performed through transcanal endoscopic approach under general anesthesia. Histopathological examination revealed the presence of black pigments from a mineral foreign body. The differential diagnosis of dark pigmented tumors located within the EAC are discussed.

Keywords: *External ear canal, tumor, melanoma, foreign body, endoscopy, surgery*

Introduction

Skin tumors of the pinna are commonly identified by dermatologists, otolaryngologists and general practictioners. Tumors of the external auditory canal (EAC) are much rarer. They are usually discovered after otoscopic examination. In this clinical case, histopathological examination conducted after transcanal endoscopic removal of a dark mass of the EAC showed mineral pigments of a foreign body, most probably coming from the lead of a graphite pencil lead. Howeever, any dark pigmented mass of the EAC skin should suggest diagnosis of melanoma.

Case-Report

A 10-year old boy presented for a hearing test before speech therapy rehabilitation.

A 0° rigid endoscope-assisted otoscopy showed a dark pigmented, irregular shaped skin mass arising from the posterior wall of the left external auditory canal (EAC) and extended to the posterior annulus of the tympanic membrane (TM) *(Figure 1)*.

Fig1. *Dark pigmented mass within EAC posterior wall*

The hearing-test was normal.

A surgical removal was planned for histopathological examination.

The operation was performed under general anesthesia, using a rigid 0° endoscope, 14 cm length and 3 mm diameter. Intraoperative bleeding was limited by the conventional patient positioning, maintenance of a low blood pressure, infiltration of the external auditory canal with ropivacaine (2 mg/mL) – adrenaline (0.25 mg/mL) solution and the use of cottonoid pledgets soaked with adrenalin (0.25 mg/mL) within the EAC as previously reported for endoscopic ear surgery (1)

The mass extended to the posterior annulus without extension within the tympanic cavity. The underlying bone was invaded, requiring an endoscopic drilling until all the black color has disappeared. The reconstruction was performed using a temporalis fascia graft anchored under the posterior annulus *(figures 2-5)*.

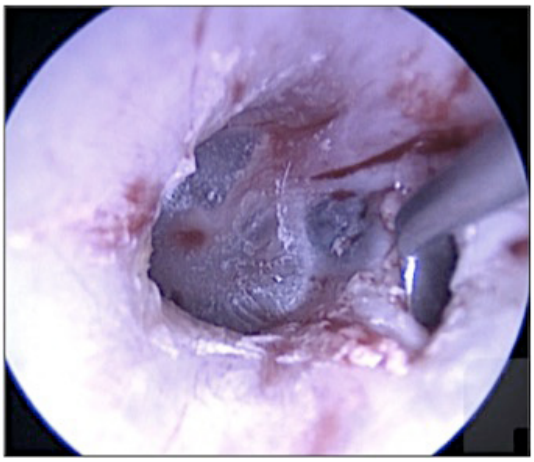

Fig2. *Meatal skin flap (0° transcanal endoscopic approach)*

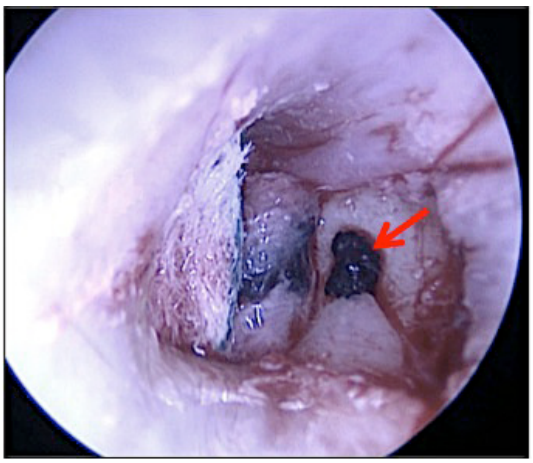

Fig3. *Underlying bone invasion*

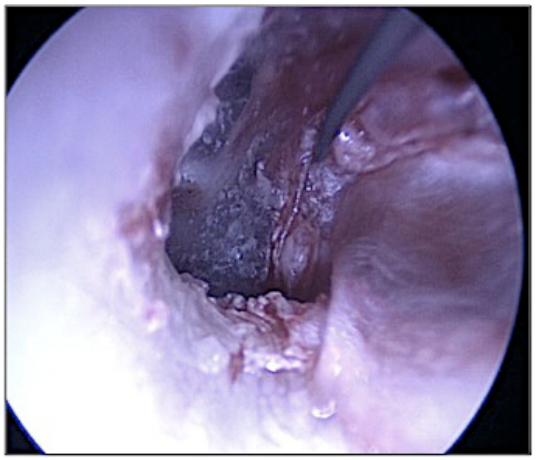

Fig4. *Anchoring of the temporalis fascia graft under the posterior annulus*

Fig5. *Result 2 months after surgery*

Several absorbable gelatin sponges were placed on the graft. A silicone roll and an Otowick was introduced into the EAC and removed on postoperative day 10.

The patient was discharged the day of the surgery. Healing was complete within 2 months. Pure-tone audiometry with air and bone conduction at 0.5, 1, 2 and 4 kHz frequencies, as well as speech audiometry was performed and remained normal.

The final histopathological examination reported black mineral pigments coming from a mineral foreign body. A traumatic origin by the penetration of a graphite pencil tip within the EAC was the most likely scenario.

Discussion

Pigmented tumors of the external ear are uncommon. Their identification is most of the time incidentally performed by otoscopy when hidden within the EAC.

Melanoma of the external ear comprise near to 1% of all melanomas. Their usual location at the pinna could be explained by the sun exposure, but this explanation fails when melanoma occur within EAC (2). Melanomas of the EAC are extremely rare. International literature report series of 1 to 3 cases, and a total of 15 cases reported until 2018 (3). The wider series including 7 cases was reported in 2020 (2).

A melanoma has to be suspected in the case of any pigmented macule-shaped tumor with irregular edges. Non-pigmented (amelanotic) melanoma within the EAC can make diagnosis even more difficult.

The tumor described in this clinical case had all the characteristics of a pigmented melanoma. However, the young age of the patient (10-year old) would have been very uncommon. Previous papers include 40 to 86-year old patients. Histopathological examination usually identifies melanocytes which are neural crest derivatives cells (2). Various tumor markers have been identified: Periodic Acid-Schiff (PAS), Warthin Starry (WS), Vimentin, and Human Melanoma Black (HMB)-45 (4). Metastatic pathways remain controversial and could be linked to genetic predisposition: lymphogenous followed by hematogenous spread, lymphogenous and hematogenous spread in the same time, lymphogenous or hematogenous spread are discussed (2). Their treatment involves tumor surgical total removal with free margins but is usually limited by the neighbouring anatomical structures. The surgery may be extended to the subtotal temporal bone removal, mastoidectomy, parotidectomy and cervical lymph nodes (20). Appelbaum et al. report a surgical management including wide local excision extended to the underlying temporal bone and Sentinel Lymph Node Biopsy (SLNB) (2). Post-operative radiation therapy, chemotherapy, and immunotherapy can be associated to reduce the risk of locoregional recurrence (2).

In situ melanoma (lentigo maligna) is usually a brown to black macule. The growing evolution is slow but this tumor can change into invasive melanoma in 30 to 50% of cases.

A pigmented skin tumor is not always a melanoma. But a melanoma has always to be ruled out after a total surgical tumor removal.

Melanocytic nevi are classified into congenital or acquired lesions. They are usually arising within the first few decades of life. Rarely located within the EAC, they can be identified on its posterior or inferior wall, mostly in its outer two third. Their color can be flesh, pink or dark with a flat, domed, pedunculed or papillomatous shape. Three kinds of nevi are described: junctional (when in contact with the lower epidermis), intradermal (when no longer contact with the epidermis) or both junctional and intradermal. Dysplasic nevi can change into malignant melanomas.

Blue nevi are special kind of nevi, composed of melanocytes but their color is gray-blue. Any change in their pigmentation has to rule out melanomas. These nevi are usually solitary lesions. When multiple blue nevi are identified within head and neck area, a Carney's syndrome (association with endocrine and nonendocrine tumors) must be suspected.

The crucial point of this clinical case is the incidental identification of a mass within the EAC. This underscore the value of a systematic otoscopy during medical consultations by generalist practitioners, pediatricians and otolaryngologists. Discovering a melanoma hidden within the EAC can actually lead to a delayed diagnosis with dramatic consequences for the patient.

The extension of the black mass into the underlying bone of the EAC required drilling of the bone until all the black color had disappeared. After discussing with the patient's next of kin, the preoperative strategy selected required a post-operative histopathological examination, including specific markers in the case of a melanoma. Per-operative histopathology examination can be discussed, as previously reported in international literature about a black foreign body inside EAC skin. Frozen sections are commonly considered as a suboptimal way of identifying atypical melanocytes (5). Moreover, an immunohistochemical examination is crucial for diagnosing a melanoma. On the other hand, the absence of melanocytes in a frozen section could at least allow the patient and his/her family to be reassured right after the surgical procedure.

The total removal of the pigmented mass was achieved through a transcanal endoscopic approach.

The ear endoscopy is an effective technique for the surgery within some anatomical spaces of the middle ear, usually hidden from the microscope (6-8). The light coming from the tip of the endoscope usually provides also a better visualization of the tympanic membrane (9). We have previously reported the Canal Endoscopic Scale (CES) as a preoperative endoscopic classification, based on the transcanal endoscopic outcomes about the visualization of the tympanic membrane, according to the anatomy of the EAC (10). The transcanal endoscopy is used by the author as a reference technique for the ear surgery. In the current case, this procedure has provided an optimal access to the posterior wall of the EAC and to the tympanic membrane. However, it is likely that in this case, transcanal microscopy could also have provided sufficient access to the mass, avoiding an endaural or a retroauricular approach.

Conclusion

A skin melanoma should be suspected in case of a dark pigmented skin mass within the EAC. This uncommon localization can lead to a delayed diagnosis and a dramatic evolution for the patient. Otoscopic examination has therefore to be performed in all medical consultations by generalist practitioners, pediatricians and otolaryngologists. The total removal of the mass can be performed through transcanal endoscopic approach with the aim to conduct histopathological examination.

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Citation: **S. Ayache.** *A Misleading Dark Pigmented Mass of the External Auditory Canal in a Child. Open Journal of Otolaryngology. 2020; 3(2): 01-04.*