Nasal chondromesenchymal hamartoma in an adolescent with pleuropulmonary blastoma

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ABSTRACT

الأورام العابية الكوندروميزينكايملية هي أورام شديدة الندرة تنشأ من الأنف والجيوب الأنفية. عادة ما تصيب هذه الأورام الأطفال تحت سن الواحدة. كيفية نشوء هذه الأورام لاتزال مجهولة ولكن لوحظ ارتباطها بالورم الأرومي الجنبوي الرئوي. بعد المراجعة وجدنا 32 حالة مسجلة أغلبها في الأطفال تحت سن الواحدة. الحالة التي نقدمها هي لمراهق في 14 من العمر أصيب بورم آرومي جنبوي رئوي في سن 6 وقد كان يعاني من انسداد بالأنف وضعف في حاسة الشم. في هذا التقرير نسلط الضوء على العلاقة بين هذا الورم والورم الأرومي الجنبوي الرئوي.

Nasal chondromesenchymal hamartoma (NCMH) is an extremely rare benign lesion arising in the sino-nasal tract. They usually affect children below one year of age. The pathogenesis of these lesions is poorly understood however, they have been associated with pleuropulmonary blastoma (PPB). Although benign, malignant transformation has been reported in the literature. On literature review, we found 32 reported cases, most of them occurring in children below one year. We report a 14-year-old adolescent male with history of PPB at the age of 6, presenting with bilateral nasal obstruction and decreased sense of smell. In our case report we highlight the association between PPB and NCMH, and describe an unusual presentation.

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Nasal chondromesenchymal hamartoma (NCMH) is a rare benign lesion of the nose and para-nasal sinuses first described by McDermott et al in 1998.[1] These lesions usually present in infancy.[1] On literature review, we found 32 reported cases.[1-10] The origin of NCMH of the sino-nasal tract is poorly understood, however, they have been linked to pleuropulmonary blastoma (PPB).[9] Although considered benign, malignant transformation has been reported.[8] We found 6 reported cases associated with PPB.[1,7,9] We report a 14-year-old adolescent male with NCMH occurring 5 years after treatment of PPB type II. Our objective in presenting this case is to highlight the association between PPB and NCMH, and describe an unusual presentation.

Case Report. We present a 14-year-old Middle Eastern male diagnosed as a case of pleuropulmonary blastoma type II at the age of 6. The tumor was surgically removed, followed by a course of chemotherapy. He was screened for the presence of other associated tumors, but no genetic testing for DICER-1 gene (protein-coding) was carried out. He was symptom free for 5 years before presenting to our service complaining of a one year history of bilateral progressive nasal obstruction, which was associated with snoring, sleep disturbance, and decreased sense of smell. On examination, he had bilateral nasal polyps filling the nasal cavities. The polyps were pearly white with a pinkish hue. His laboratory workup was unremarkable. He underwent non-contrasted CT scan of the nose and para-nasal sinuses, which revealed multiple polypoidal soft tissue densities occupying both nasal passages with a calcific component seen on the left side. The rest of the para-nasal sinuses were well aerated, with no orbital or intra-cranial extension (**Figure 1**). He underwent endoscopic resection of these nasal polyps. Intra-operatively the nasal mucosa of the nose and para-nasal sinuses was normal looking, however, the inferior and middle turbinate on both sides were atrophic due to longstanding pressure from the nasal mass. The histopathological evaluation was consistent with NCMH (**Figure 2**).

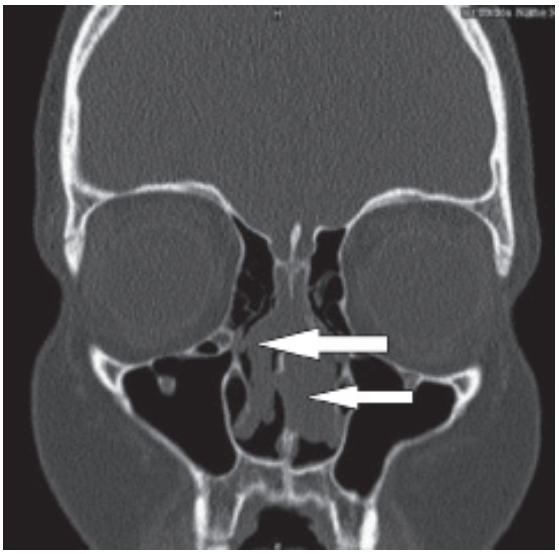

Figure 1 - None-contrasted coronal CT scan, showing section through the maxillary sinus. There are polypoidal densities involving both nasal cavities (white arrows). Other sinuses are spared. There is no orbital or intra-cranial involvement.

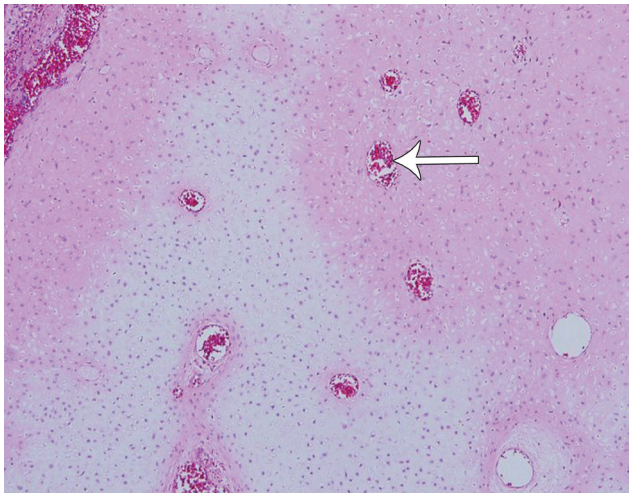

Figure 2 - High-power photomicrograph, Hematoxylin & Eosin stain showing multiple lobules of benign cartilage scattered in a myxoid stroma. Multiple blood vessels can be seen (white arrow).

Discussion. Nasal chondromesenchymal hamartoma is a term initially suggested by McDermot et al in 1998,[1] describing a mass lesion consisting of chondroid and mesenchymal elements occurring in the nasal cavities of young children. The nasal hamartoma is either of the mesenchymal or epithelial type depending on the predominant tissue; however, mesenchymal hamartomas are more common.[1] The NCMH is a rare tumor of the nose and para-nasal sinuses that affect infants predominantly. Although considered benign, malignant transformation has been reported in the literature.[8] On literature review, we found 32 reported cases in the English literature, 6 of which were associated with PPB.[1-10] In our case report, we highlight the association between NCMH and PPB, although the etiology of this tumor remains unknown.[10] They were initially thought to be developmental or congenital, but the development of these lesions in adults with asymptomatic childhood makes these theories unlikely.[10]

The NCMH is now associated with DICER-1-related disorders. This is a familial tumor susceptibility syndrome that has an increased risk for several tumors such as PPB, ovarian sex cord-stromal tumors, cystic nephroma, and thyroid gland neoplasia. Other less observed tumors are NCMH, renal sarcoma, and pituitary blastoma.[2] Individuals younger than 40 years among families with a DICER-1 germline mutation are more susceptible to the development of these tumors.[2] A review of 32 cases reported in the literature, including our case, shows that NCMH is predominately seen in infant males. The remainder of cases ranged between 19 months and 69 years.[10] Nasal obstruction, respiratory distress, feeding difficulties, along with rhinorrhea or epistaxis are the usual presenting symptoms; however, this is dependent on the size and the location of the tumor.[4,5,7] The most common differential diagnosis of pediatric nasal mass is cystic fibrosis, neuroblastoma, neurofibromatosis, rhabdomyosarcoma, chondroma, and chondrosarcoma. Uncommonly, those patients might present with complications including orbital or intra-cranial extension that might mimic malignancy.[4,5,7] The NCMH might develop years after the initial diagnosis of PPB, and close follow up is always mandatory.

In cases of NCMH, CT scan and MRI are helpful in the evaluation of the para-nasal sinuses, as well as adjacent structures such as orbit, and intra-cranial cavity. Aggressive behavior with bony erosion, thinning, and displacement, can be seen and might raise the suspicion for malignancy.[8,10] Intra-cranial extension through the cribriform plate can also be seen.[1,4,5,7] However, frank bony destruction is not a feature of NCMH.[5] The NCMH are typically seen as a non-encapsulated, poorly defined mass on imaging.[1,5] Calcification on CT scans is noted in 50% of patients.[7] They are usually unilateral, and bilaterality as in our case, is unusual. In our case, the CT scan showed a benign looking polypoid mass restricted to the nasal cavity with no orbital, intra-cranial, or sinuses involvement. There were no signs of boney destruction. However, there should always be a high index of suspicion when dealing with PPB patients. The NCMH can have variable enhancement patterns on MRI; however, they are usually isointense on

T1-weighted images and hyperintense on T2-weighted images. A bright signal intensity can be seen on imaging and usually indicates the presence of cystic changes.[10] Hemangioma, angiofibroma, glioma, and inverted papilloma are the most common radiological differential diagnoses of a sino-nasal mass in pediatric age group.[7]

Microscopically the most prominent feature of NCMH is irregular islands of mature and immature hyaline cartilage, impeded in a myxoid background.[10] These lesions are usually positive to several stains including smooth muscle actin, S-100, vimentin, KP-1, and Leu-7.[10] Increased mitotic activity, cytological atypia, and foci of necrosis are an indication of malignant transformation.[8]

Surgical excision remains the treatment of choice for NCMH.[1,4] The surgical approach depends on the extent of the lesion; however, most lesions can be removed endoscopically. Clean margins can be difficult to obtain owing to the infiltrative nature of the disease.[7] A multidisciplinary team approach involving neurosurgery, ophthalmology, and otorhinolaryngology would likely achieve the best chance at surgical cure.[7] Recurrence is unusual, and is the result of incomplete resections or microscopic deposits of residual tumor.[1] If complete surgical resection is achieved no further adjuvant therapy is necessary.[7] However, Shet et al[3] reported that NCMH responds to radiation therapy and combination chemotherapy, which may be helpful when complete tumor excision is not possible. Treatment of residual or unresectable disease can be difficult due to the current limited clinical experience.

In conclusion, we report a case of NCMH in an adolescent male. This is a rare tumor of early childhood, which can also be found in older children. The etiology of NCMH remains unknown; however, its association with PPB has been described in literature. Otorhinolaryngologists and pediatric oncologists should be aware of this disease entity and its variable clinical presentations, as well as its association with PPB to avoid delays in diagnosis and management.

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