Collision Skull Base Tumors: Chondrosarcoma and Juvenile Nasopharyngeal Angiofibroma. Case Report and Review of Literature.

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Background

Skull base chondrosarcomas represent a rare malignant pathological entity which accounts for 0.15% of intracranial tumors.[1,2] Juvenile nasopharyngeal angiofibromas (JNA) are rare, benign but locally aggressive, highly vascular tumors comprising up to 0.5% of all head and neck tumors.[3-5]

Although collision skull base tumors represent a paucity, the co-existence of skull base chondrosarcoma and JNA has never been reported in the literature to date.

Case description

A 17-year-old male presented with nasal obstruction for a few months; imaging work-up demonstrated a mass in the right nasal cavity extending into right nasopharyngeal space, most consistent with JNA. Additionally, initial imaging showed a localized area of abnormal signal intensity affecting the right petrous apex, however, it was completely distinct from the JNA and was thought to represent a benign process. The patient underwent embolization of the JNA followed by endoscopic endonasal resection. Postoperative follow-up imaging demonstrated no evidence of residual or recurrent disease; no changes were noted to the right petrous apex lesion.

Patient was lost to follow-up, then presented 9 years later with persistent right-sided hearing loss that prompted work-up; head CT and brain MRI demonstrated a large heterogenously enhancing expansile mass centered at the petroclival region, extending into middle and posterior fossae, invading the right cavernous sinus, clivus, right occipital condyle with extracranial component, and significantly compressing the brainstem and cerebellum. An endoscopic endonasal biopsy of the lesion was performed, after which the patient underwent a staged surgical resection via a retrosigmoid craniotomy followed by endoscopic endonasal resection. Both surgical interventions were uneventful, and he had an excellent postoperative recovery. Histopathological examination was consistent with chondrosarcoma WHO grade II. Following a multidisciplinary discussion, patient proceeded with adjuvant proton beam radiation therapy.

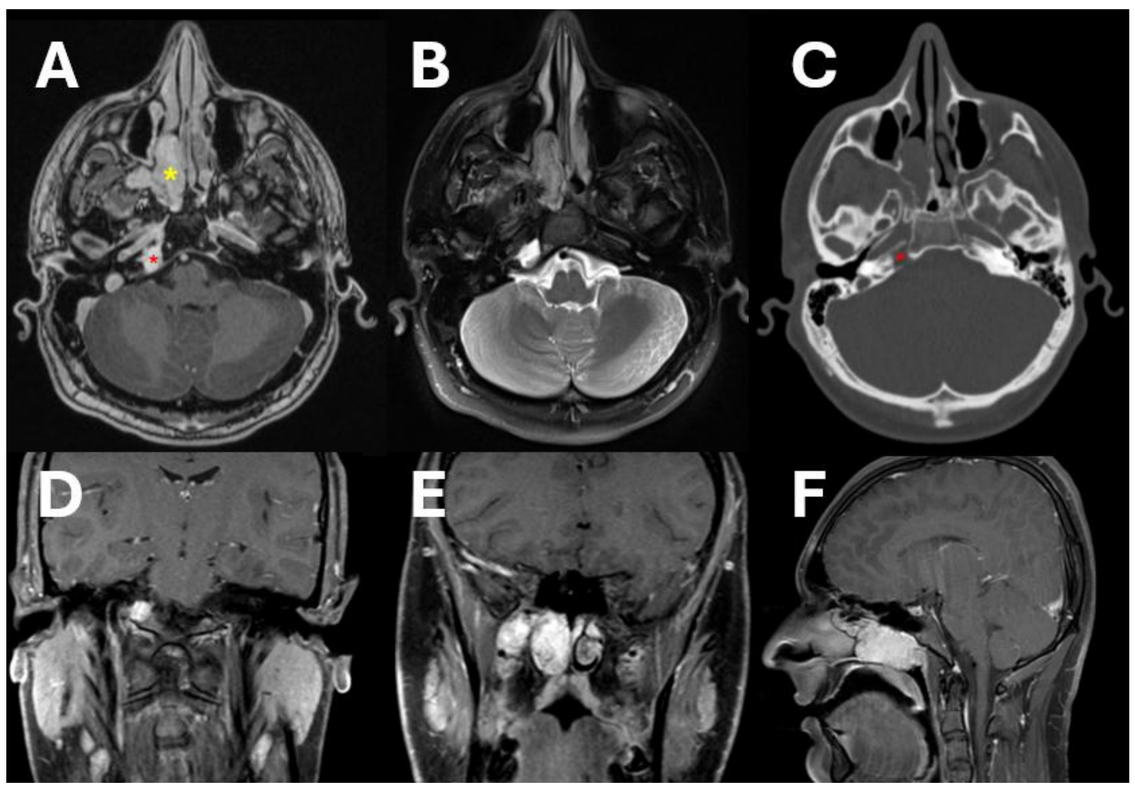

Figure 1: Imaging at presentation. Brain MRI axial T2WI (A) and axial T1WI contrast-enhanced (B) showing the JNA (yellow asterisk) in the right nasal cavity extending into right nasopharyngeal space and pterygopalatine fossa. Note the enhancing lesion in the right petrous apex (red asterisk), completely distinct from the JNA. Head CT axial bone window (C) showing a radiolucent bony lesion (red asterisk) at the right petrous apex. Brain MRI T1WI contrast-enhanced coronal (D, E) and sagittal views (F) showing the petrous apex enhancing lesion (D) and JNA (E, F)

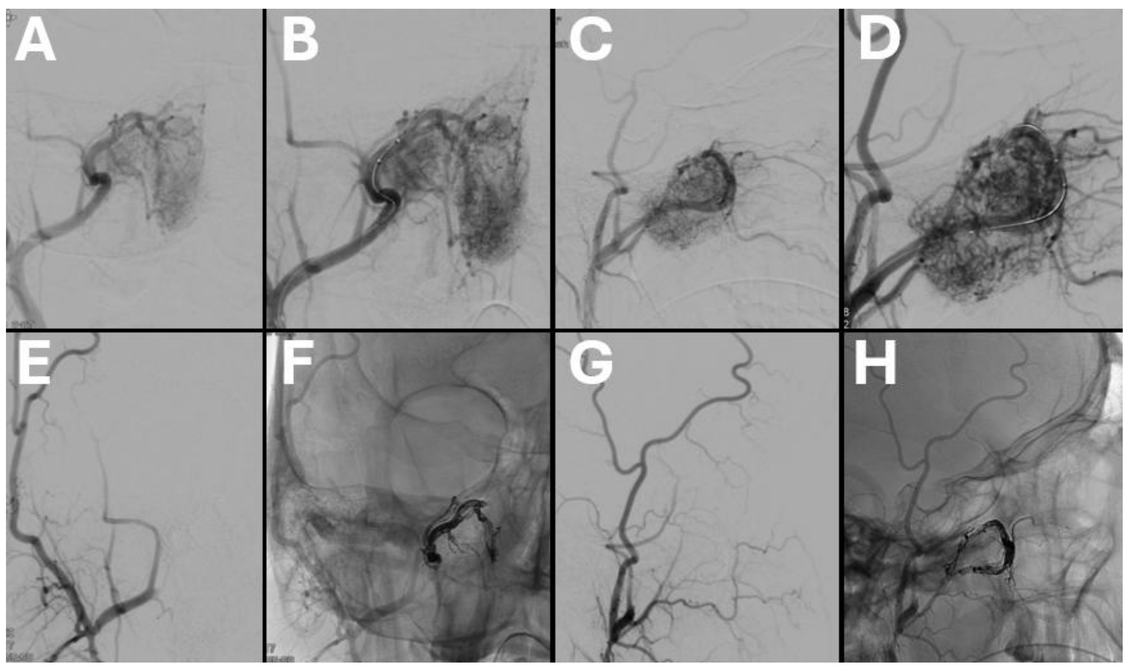

Figure 2: Selective injection of the right external carotid artery in AP and lateral projections (A and C) with close-up views (B and D) respectively showing the microcatheter superselecting the feeding branch off of the right sphenopalatine artery along with intense tumor blush. Subtracted and unsubtracted images of selective injection of the right external carotid artery in AP (E, F) and lateral projections (G, H) respectively demonstrating marked reduction in tumor blood blush and showing the embolic material.

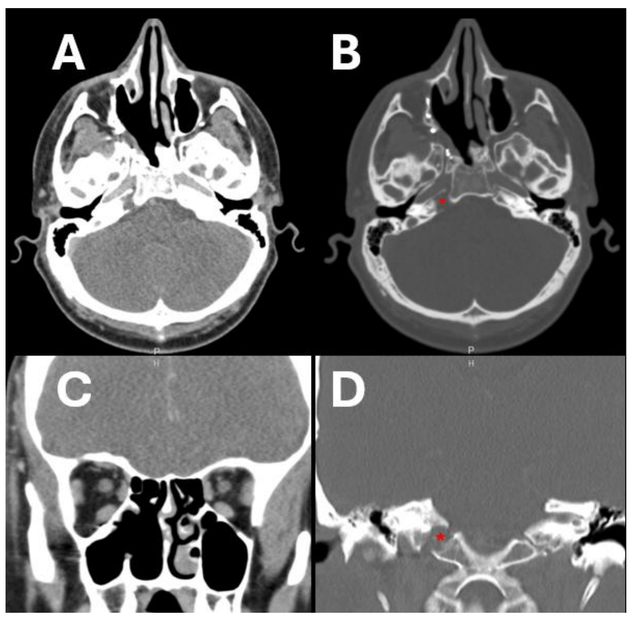

Figure 3: Postoperative head CT axial (A, B) and coronal (C, D) views at 18 months follow-up after endoscopic endonasal resection of JNA showing gross total resection. Note the bony lesion at the right petrous apex (red asterisk in B and D) was stable.

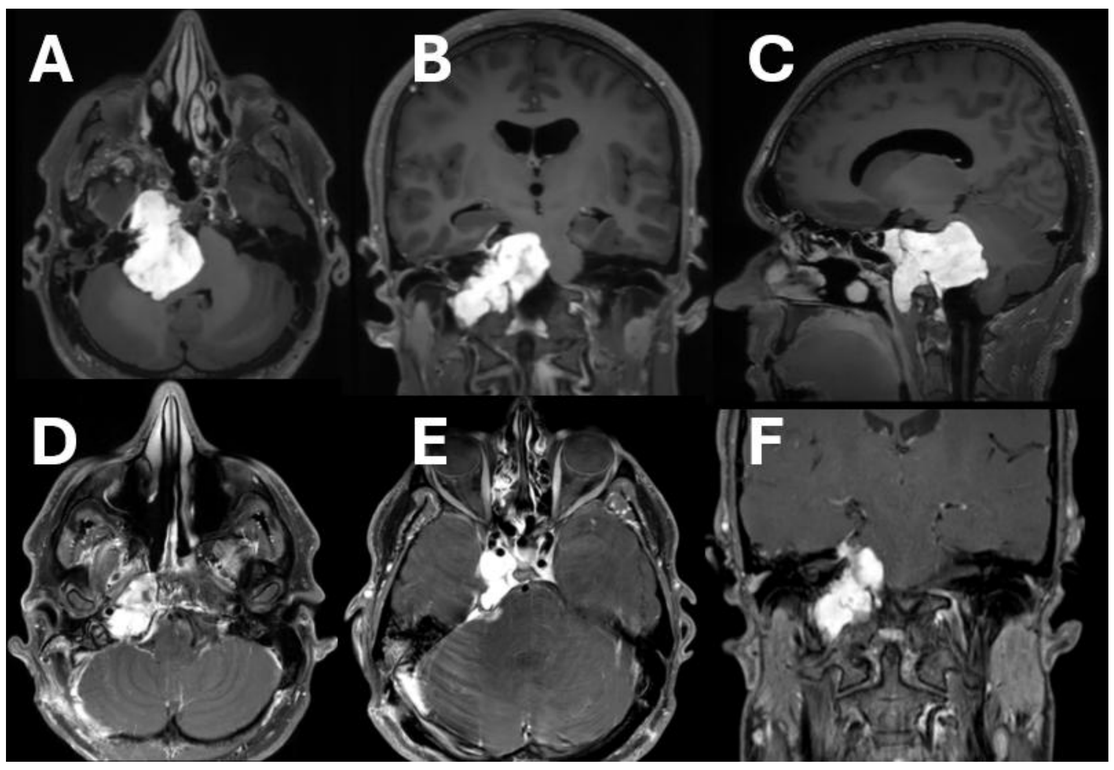

Figure 4: Brain MRI axial, coronal, and sagittal contrast-enhanced T1WI (A, B, C) demonstrating a large expansile lobulated multicompartmental heterogenously enhancing lesion centered at the petroclival region with extension into middle and posterior fossae. Brain MRI axial, coronal, and sagittal contrast-enhanced T1WI (D, E, F) following staged resection of chondrosarcoma, showing marked improvement of mass effect on the brain stem and cerebellum, and the residual tumor at the right petrous bone and right cavernous sinus.

Conclusions

collision skull base tumors represent an exceedingly rare occurrence yet have a great impact on patients' outcomes and overall quality of life. Our report highlights the importance of considering collision tumors in the differential diagnosis of skull base lesions, which may provide guidance for follow-up intervals and optimal surgical strategies. To date, this is the first report in the literature of concomitant skull base chondrosarcoma and juvenile nasopharyngeal angiofibroma.

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