CASE REPORT
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JUVENILE NASOPHARYNGEAL ANGIOFIBROMA RECURRENCE ASSOCIATED WITH EXOGENOUS TESTOSTERONE THERAPY

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Abstract: Background. Juvenile nasopharyngeal angiofibromas (JNAs) are rare benign lesions that express hormonal receptors. This report describes a recurrence of a JNA 20 years after excision associated with exogenous testosterone therapy.

Methods. A 36-year-old man developed a sphenoid mass 20 years following resection of a JNA, shortly after initiating exogenous testosterone therapy for symptomatic low endogenous testosterone.

Results. The mass was subsequently excised and was histologically consistent with a JNA. The patient resumed his testosterone therapy postoperatively. Repeated imaging has demonstrated no recurrence after 3 years.

Conclusion. This unique case adds further evidence to the role of testosterone in the pathogenesis of JNAs. Exogenous testosterone can cause tumor regrowth at any time, even decades following treatment. The patients with a history of JNA, even those without recurrence for years, should weigh the risk of recurrence before the use of exogenous testosterone. © 2009 Wiley Periodicals, Inc. Head Neck 32: 812–815, 2010

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Juvenile nasopharyngeal angiofibromas (JNAs) are rare benign growths that occur all but exclusively in adolescent males. These are histologically benign tumors composed of vascular channels within a fibrous stroma that are nonetheless locally aggressive. Typically arising at the sphenopalatine foramen, their local growth and recurrence puts at risk numerous skull base structures.

The predilection of JNAs for adolescent males is postulated to be explained by the presence of hormonal receptors expressed in the tumor.1,2 Coutinho-Camillo et al3 recently reviewed the possible molecular mechanisms for these effects. We report herein a case of JNA recurrence 20 years following surgical excision coinciding with the initiation of exogenous testosterone therapy.

CASE REPORT
A 36-year-old male presented to the senior author (RRO) for evaluation of a sphenoid mass. The patient had been found to have...
symptomatic low endogenous testosterone and was started with testosterone replacement. Three months later, an MRI of the skull base with intravenous contrast was performed to evaluate the pituitary gland. This demonstrated a mass confined to the right sphenoid sinus with enhancement on the postcontrast images. Subsequent CT imaging confirmed the MRI findings and showed erosion of the surrounding bone with partial preservation of pterygopalatine fossa fat (Figure 1).

As part of the patient’s past medical history, he had undergone a transpalatal resection of a right-sided JNA 20 years previously at age 16 years (Figure 2). He had no postoperative radiation. He remained asymptomatic postoperatively, and subsequent semiannual imaging at the age of 23 years found no recurrence of the lesion.

Upon presentation to clinic, the patient reported mild headaches behind the right eye and denied any nosebleeds or nasal airway obstruction. On physical examination, the patient had a severely deviated septum to the right, and a flexible fiberoptic endoscopy revealed no obvious lesions upon the visualiza-

![FIGURE 1. CT of a patient 20 years after transpalatal resection of a juvenile nasopharyngeal angiofibroma. A soft tissue mass is seen along the right lateral sphenoid wall, with extension of the lesion through the lateral anterior sphenoid wall into the pterygopalatine fossa. The pterygopalatine fossa is otherwise intact.](image1)

![FIGURE 2. CT of patient at age 16, before transpalatal excision. This early generation CT demonstrates a nasopharyngeal mass with relative sparing of the pterygopalatine fossa.](image2)
Initially, the patient opted for stopping his testosterone therapy and repeat imaging after 3 months. The subsequent CT scan did not show any further tumor growth, but the patient was unhappy with the effects of his low endogenous testosterone. After revisiting the risks and benefits of his options, he decided to undergo endoscopic removal of the lesion.

Following preoperative embolization of the lesion via the sphenopalatine artery (Figure 3), the lesion was removed using an endoscopic approach. The lesion was found to extend into the right pterygopalatine fossa and sphenoid inferior floor. Additional extension into the clivus was also found. All gross tumors were resected, and the clivus was drilled out. No neural structures were sacrificed, and the patient had full cranial nerve function postoperatively.

One month following the resection, the patient underwent baseline imaging and restarted his exogenous testosterone therapy. The patient was followed up for 3 years postoperatively and no tumor was detected either radiologically or endoscopically.

**DISCUSSION**

The patient was seen with a JNA that recurred 20 years after treatment, coincident with the use of exogenous testosterone. The lesion continued to grow while the testosterone therapy continued and then stopped when the therapy was stopped, clearly implicating the exogenous hormone in this recurrence.

JNAs occur in areas difficult to access and have a number of vital neural and vascular structures adjacent to them, including the optic nerve and internal carotid artery. These characteristics make complete excision challenging, regardless of the approach chosen. Hofmann et al. discovered that approximately 14% of JNA recurred after a mean follow-up of about 52 months. The average time of recurrence was 14 months following treatment.

These lesions have a predilection for occurring and recurring in adolescent males. The levels of serum testosterone peak in the late teens to early 20s and decline slowly but steadily after that. Estrogen levels show a parallel though much lower rise in males during teenage years. JNAs are known to harbor receptors for both estrogen and testosterone. Their clinical behavior, supported by these immunohistochemical findings, has implicated these hormones as etiologic factors. The case reported herein further corroborates the role of testosterone and raises interesting implications for subsequent exogenous androgen use in these patients.

The recurrence of this patient’s lesion 20 years after treatment illustrates the need to carefully follow patients with history of a JNA being considered for exogenous androgen therapy. This patient’s lesion grew rapidly while he was undergoing testosterone therapy. In patients with a history of previous JNA, in which exogenous testosterone therapy is indicated, recurrence of the JNA must be considered a risk, no matter how much time has transpired since treatment. If testosterone therapy is instituted, baseline imaging with frequent (trimonthly or semiannual) and subsequent imaging is advisable. Moreover, a national survey in 2007 demonstrated that 2.3% of male high school seniors were using anabolic steroids. The patients with JNA should be strongly counseled about the risk of exogenous anabolic steroid use.

This unique case adds further evidence to the role of testosterone in the pathogenesis of JNA and its recurrences. It further points to the possibility of testosterone leading to tumor
regrowth at any time, even decades following treatment. Patients with a history of JNA, even those without recurrence for years, should weigh the risk of recurrence before the use of exogenous testosterone. If the patient and his physician choose to proceed with testosterone replacement, careful follow-up for possible tumor regrowth is strongly recommended.

REFERENCES