

Juvenile Nasopharyngeal Angiofibroma (JNA): A Simplified Radiological Staging Based on Predominant Growth Patterns



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Abstract

Juvenile Nasopharyngeal Angiofibroma (JNA) is an uncommon benign, yet locally aggressive vascular tumor that originates from the vicinity of the sphenopalatine foramen (SPF) and primarily affects adolescent males. Despite its benign nature, JNA can cause significant morbidity due to local tissue invasion. This study proposes a simplified staging system based on distinct growth directions (regarding the SPF): <u>endophytic</u>, <u>lateral</u>, and <u>cranial</u> (extradural or intradural). Each of these patterns should be mentioned by its first letter (E, L, Ce, or Ci). We illustrate this staging proposal with radiological imaging of cases diagnosed and treated at our institution. This simplified classification aims to optimize therapeutic strategies, which may include surgical resection (endoscopic or open), radiation therapy, hormone therapy,

Pictorial Guide Endophytic Growth Lateral Growth Cranial Growth ★ Sphenopalatine **Figure 1**. CT images on the axial and coronal plane showing three possible Foramen (SPF) growth patterns from the SPF



Introduction

Juvenile Nasopharyngeal Angiofibroma (JNA) is a rare, benign, yet locally aggressive vascular tumor. It primarily affects adolescent males and, despite its benign nature, can cause significant morbidity due to local invasion of adjacent tissues. Traditional staging systems for JNA can be complex and cumbersome. This study aims to define the main predominant growth patterns of JNA and propose a simplified radiological staging system based on these patterns, using CT and MRI as imaging tools.

Classification

In our radiologic staging proposal, cases are classified as having one of the following growth patterns: endophytic, lateral, and cranial. Each of these patterns should be referred to by its first letter (E, L, or C). Cranial growth pattern can be limited to the skull base (extradural) or invade it violating the dura mater (intradural), and should be sinalized by 'e' or 'i' after the letter C, respectively.

Endophytic (E): Tumor growth medial to the SPF.

Lateral Growth (L): Tumor growth lateral to the SPF.

Cranial Growth (C): Tumor growth cranial to the SPF (Ce if extradural or Ci if

Figure 2 Axial (A) and coronal (B) T1-weighted gadolinium contrast-enhanced fat-suppressed MR images. Endophytic Growth - E



Figure 3. Axial (A) and coronal (B) T1-weighted gadolinium contrast-enhanced fat-suppressed MR images. Endophytic and Cranial (extradural) Growth - ECe





Figure 4. Axial (A) and coronal (B) T1weighted gadolinium contrast-enhanced fat-suppressed MR images. Endophytic and Cranial (extradural) Growth - ECe

intradural).

Data Collected: Tumor growth patterns, Imaging findings, Treatment modalities, Surgical outcomes.

Discussion

Significance of Growth Patterns

Endophytic (E): Generally easier to manage surgically, being often suitable for endoscopic resection with a lower risk of complications.

Lateral (L) and Cranial (C): Require more complex surgical approaches, such as open surgery following preoperative embolization to reduce vascularity and bleeding risks. In some cases, radiation therapy or hormone manipulation may be necessary, especially when there is cranial invasion.

Conclusions

A simplified radiologic staging system based on the main predominant growth patterns of JNA provides a practical guide to make it easier to classify cases and optimize therapeutic strategies.





Figure 5. Axial (A) and coronal (B) T1weighted gadolinium contrast-enhanced fat-suppressed MR images. Endophytic, lateral and cranial (extradural) pathways of Tumor Growth - ELCe







Figure 6. Axial (A,C) and coronal (B,D) T1-weighted gadolinium contrast-enhanced fat-suppressed MR images from two different patients. Endophytic, lateral and cranial (intradural) - ELCi



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