بِسْمِ اللهِ الرَّحْمنِ الرَّحِيمِ

"قَالَ رَبِّ اشْرَحْ لِي صَدْرِي وَيَسِّرْ لِي أَمْرِي وَاحْلُلْ عُقْدَةً مِنْ لِسَانِي يَفْقَهُوا قَوْلِي"

صدق الله العظيم
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Endoscopic Resection of Juvenile Nasopharyngeal Angiofibroma

Essay

Submitted for fulfillment of M.Sc.Degree in otorhinolaryngology

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Abstract

Angiofibroma can be diagnosed using CT, MR imaging and angiography. CT is a most important pre-operative test because it is useful for showing the destruction of bony structures and widening of foramen and fissures at the skull base due to spread of tumor. CT can also help recognize invasion of sphenoid and thus determine the aggressiveness of surgery. On CT, bone involvement and tumoral spread can be seen best on thin-section axial or coronal images. MRI is useful to show presence of intracranial extension of the tumor. MRI also helps discern between sinus invasion, obstruction and retention of secretions. On MR imaging, JNA appears as a heterogenous mass with signal voids (representing hypertrophic tumor vessels) that are consistent with the highly vascular tumor; intense enhancement with gadopentetate contrast material is typical.

Key word: CT-GPN- Sphenopalatine- Investigation- Embolization

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DEDICATION

This thesis is dedicated to the persons I admire most, to my father and mother who offered me unconditioned support throughout the course of my life. Also, this thesis is dedicated to my wife who has been a great source of motivation and inspiration, and to my beautiful angels my daughter and my son.

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Transforming growth factor B	(TGF-B)
Vascular endothelial growth factor	(VEGF)
Proliferative marker	(KI67)
Insulin-like growth factor II	(IGF II)
Adenomatous polyposis coli	(APC)
Juvenile nasopharyngeal angiofibroma	(JNA)
Functional endoscopic sinus surgery	(FESS)
Multi-detector computed tomography	(MDCT)
Magnetic resonance imaging	(MRI)
Computed tomography	(CT)
Internal maxillary artery	(IMA)
Polyvinyl alcohol	(PVA)
Anterior posterior	(AP)
Infratemporal fossa	(IFA)
Sphenopalatine foramen	(SPF)

Sphenopalatine artery	(SPA)
Sphenoid sinus	(SS)
Maxillary antrostomy	(MA)
Internal maxillary artery	(IMA)
Sphenopalatine ganglion	(SPG)
Greater palatine nerve	(GPN)
Infraorbital nerve	(ION)
Supraorbital fissure	(SOF)
Isobutyl-2-cyanoacrylate	(IBCA)
Arteriovenous malformation	(AVM)

INTRODUCTION

The presence of angiofibroma was recognized since ancient times by Hippocrates. Juvenile angiofibroma is an uncommon, benign and extremely vascular tumor that arises in the tissues within the sphenopalatine foramen. From this site, it grows along a plane of least resistance into the nasopharynx and occasionally into the nasal cavity, paranasal sinuses, orbit, infratemporal fossa or cranial cavity. The prefix "nasopharyngeal" which is often applied to this tumor, therefore, is anatomically incorrect. It develops almost exclusively in adolescent males, though there are reports of this tumor being found in children, the elderly, young and even pregnant women. Likewise, the prefix "juvenile" is also inappropriate *(Windfuhr et al., 2004).*

Angiofibroma accounts for up to 0.5% of all head and neck tumors *(Eloy et al., 2007).* It has an average age of onset of 15 years *(Paris et al., 2001).* It is the most common benign tumor in the nasopharynx *(Batsakis, 1979)* and much has been written about them both because of the misunderstanding of its growth characteristics and because of the continuing evolution in their management. According to *(Acuna, 1956)*, the condition was known to and treated by Hippocrates but the first authentic case treated by surgery was reported by *(Liston, 1841)* and verified as angiofibroma by*(Myhre and Michaels, 1987)* from histological sections made from the original operative specimen. *(Chelius, 1847)* noted the fibrous nature of the lesion and its occurrence at about the time of puberty, and *(Gosselin, 1873)* emphasized the occurrence of nasopharyngeal fibrous polyps exclusively in young males, and noted that while some lesions tend to regress as the patient

becomes adult, others required surgical removal. The term juvenile nasopharyngeal fibroma was introduced by *(Chauveau, 1906)*, and *(Friedberg, 1940)* suggested the name angiofibroma.

Angiofibromas might also be seen in head and neck locations other than the nasopharynx *(Dere et al., 2006).* Some existing reports indicate the presence of angiofibroma in nasal septum, middle turbinate, hard palate, and alveolar ridge *(***Capodiferro et al., 2005)**. However, primary extra nasopharyngeal sites are rare *(Alvi et al., 1996).* In 1982, Ali and Jones reviewed the literature and compiled 36 cases of extra nasopharyngeal angiofibroma, which was updated to 43 cases by Sarpa and Novelly in 1989 *(Sarpa et al., 1989).* Women accounted for 25.5% of these previous cases, and the mean age at presentation was 22 years. This is in contrast to the extreme rarity of nasopharyngeal angiofibromas in women and the mean age of presenta on of 17 years with nasopharyngeal angiofibroma.Therefore, unlike classic juvenile nasopharyngeal angiofibromas, extra nasopharyngeal angiofibromas occur more commonly in females and tend to present at a later age *(Schick et al., 1997).*The common sites of origin of extra nasopharyngeal angiofibroma are listed in table 1, with the most common site being the maxillary sinus.