

Angiofibroma Treatment Evaluation in a Tertiary Center: Recurrences and Complications

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Abstract

Introduction: Juvenile nasopharyngeal angiofibroma (JNA) is a locally aggressive benign vascular tumor exclusively amongst adolescent males.

AIM: This is a retrospective study to determine general characteristics, management, and outcomes amongst 120 patients presenting with juvenile nasopharyngeal angiofibroma in a single academic hospital during the past ten years.

METHODS: The medical records of 120 male patients that were histologically confirmed as having juvenile nasopharyngeal angiofibroma who underwent transnasal endoscopic surgery between August 2010 and September 2020 were retrospectively reviewed. Demographical data, clinical presentation, surgical reports, pre-and postoperative images, and follow-up information were reviewed, including the preoperative embolization and different surgical approaches performed. The parameters investigated were the tumor stage and the rates of recurrence. Subsequently, a comparison was made between patients who had undergone embolization versus those who had not been embolized, efficacy and safety of preoperative embolization, and effect of tumor stage and embolization on recurrence.

RESULTS: In these 120 patients (mean age, 18 years), four patients were at stage Ia, five were at stage Ib, 10 were at stage IIa, 21 were at stage IIb, 22 were at stage IIc, and 37 were at stage IIIa, and 21 IIIb based on the Radkowsky classification. 65% of patients underwent preoperative embolization. Predominant clinical presentation includes nasal obstruction followed by spontaneous epistaxis. The surgeons operated on 96% of these patients using endoscopes, while in 1.7 % lateral rhinotomy and the rest of cases, combined endoscopic approach and craniotomy were used. The primary recurrence rate was 16.7%, and one patient expired.

CONCLUSIONS: The patient's age has nothing to do with the recurrence rate. Embolization reduces the bleeding during the operation but has nothing to do with the recurrence rate. Recurrence is more common in higher stages. The most common site of recurrence is the intracranial region. The highest rate of complications is seen in patients with a higher stage of the tumor. Follow-up patients with periodic Postoperative CT scans should be performed for at least three years after surgery to detect recurrence in the early stages of asymptomatic patients.

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INTRODUCTION

Angiofibroma is a sporadic benign vascular tumor found almost exclusively in young men. It accounts for about 0.5% of head and neck tumors, and its prevalence is 1: 150,000(15). It is a histologically benign but highly vascular and locally invasive tumor with characteristic epidemiological features and growth patterns(3). They have fascinating pathophysiology that is not fully understood. JNAs may originate from a remnant of the first branchial arch artery, and some consider them vascular malformations(4). The clinical features are unilateral nasal obstruction and epistaxis, which occur in more than 80 % of cases, as well as various other symptoms, including facial deformity, diplopia, exophthalmos, rhinolalia, headache, and ear complications(5). Diagnosis is based on thorough anamnesis, otolaryngological examination (including nasal endoscopy), and pre-operative contrast-enhanced computed tomography (CT) and magnetic resonance imaging (MRI). The examiner should avoid a biopsy because of the risk of massive epistaxis(16). At imaging, JNA appears as a highly vascularized and expansile lesion centered on the pterygopalatine fossa (PPF) in both imaging (MRI). (7) In recent studies, the pterygoid wedge is proposed as the site of origin for JNA instead of the sphenopalatine foramen(8). CT and MRI are complementary in diagnosing JA, as CT emphasizes skull base bony involvement. At the same time, MRI is superior in demonstrating intracranial, orbital, and cavernous sinus invasion(7). Tumor staging is based mainly on imaging studies (computed tomography [CT] and magnetic resonance imaging [MRI]) and, most recently, nasal endoscopy. Different staging systems have been developed, but the most commonly used are Sessions, Fisch, Chandler, Andrews, Radkowski, and Onerci(17). Surgery is the treatment of choice for JNA, and for many years several different open-surgery approaches have been used to manage this tumor with acceptable morbidity and mortality(13). Due to the vascular nature of the tumor, intraoperative bleeding is a challenge. Embolization has been proposed as an effective method of reducing intraoperative bleeding since the 1970s, but some surgeons still report an increased risk of residual tumor in embolized patients(9). In this study, we examine patients who have undergone surgery in the past ten years in a TUMS university referral center retrospectively and analyze the results and follow-up of patients.

METHODS AND MATERIALS

A cross-sectional retrospective study was carried out using data from a review of the medical records of 120 male patients histologically confirmed as having JNA, who underwent surgery in Amiralam hospital, Department of Otorhinolaryngology, Head and Neck Surgery, TUMS School of Medicine, between 2009 and 2019, were retrospectively reviewed. The study was performed according to the World Medical Association Declaration of Helsinki (1975). The examiners collected the following information: Epidemiological and clinical data, age, sex, symptoms, debut of symptoms, diagnostic procedures, tumor localization, tumor size, embolization, surgical approach, blood loss, blood transfusions, postoperative hospitalization, follow-up, recurrence, complications, and death. Radkowski's classification based on preoperative computed tomography (CT) and magnetic resonance imaging (MRI) was adopted.

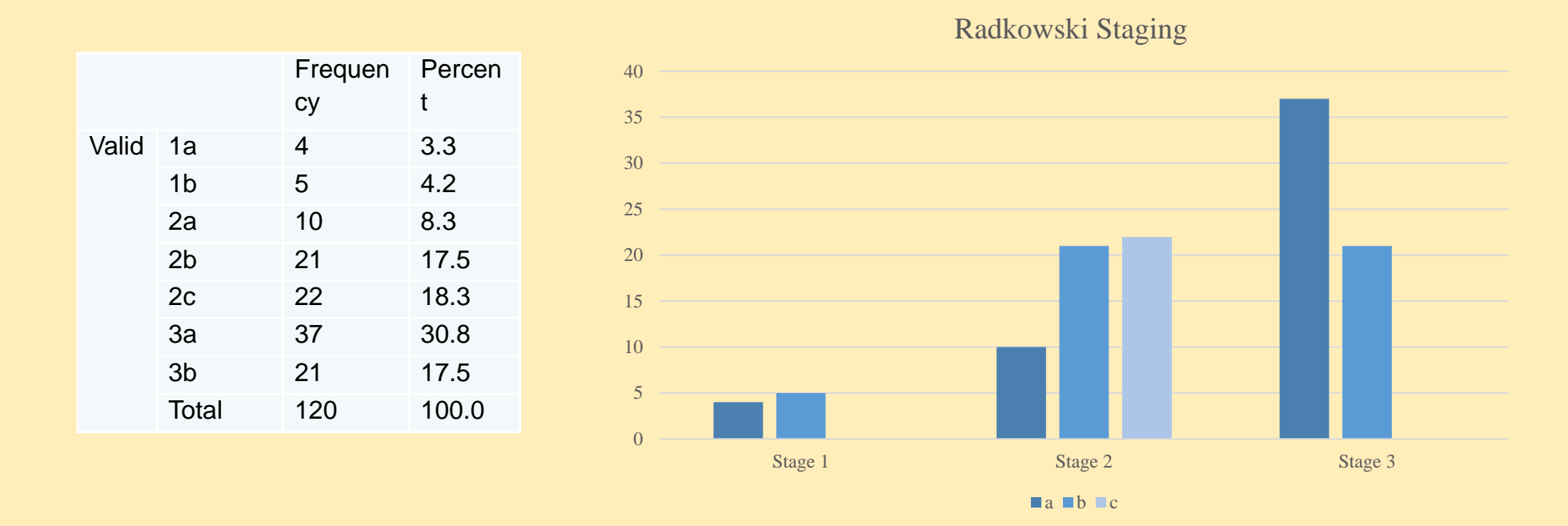
RESULTS

One hundred twenty male patients with angiofibroma who underwent surgery in TUMS Otorhinolaryngology Hospital between 2010 and 2010 with definitive pathology were analyzed. The age range of patients was between 7 and 49 years, of which 70.8% of patients were between 13 and 21 years. The mean age of patients was 18.35 years. The most common symptom of patients with nasal congestion was reported at the initial visit (55%), followed by epistaxis, with 32.5% being the second most common symptom. Other symptoms included swelling of the face, rhinorrhea, discharge from the back of the throat, anosmia, and ear congestion. The average follow-up period of patients is 68 months with a standard deviation of 69.6 ± 34.04. In The pathology reports, the mean tumor size in pathology is 8.5 cm. The minimum reported size was 1 cm, and the maximum was 13 cm. Tumor size was notified based on the maximum tumor length reported in the pathology. There was no statistically significant difference in the mean age between patients with recurrence and patients without recurrence (p = 0.76). Also, tumor size was not statistically significant in patients with recurrence and without recurrence (p = 0.83).

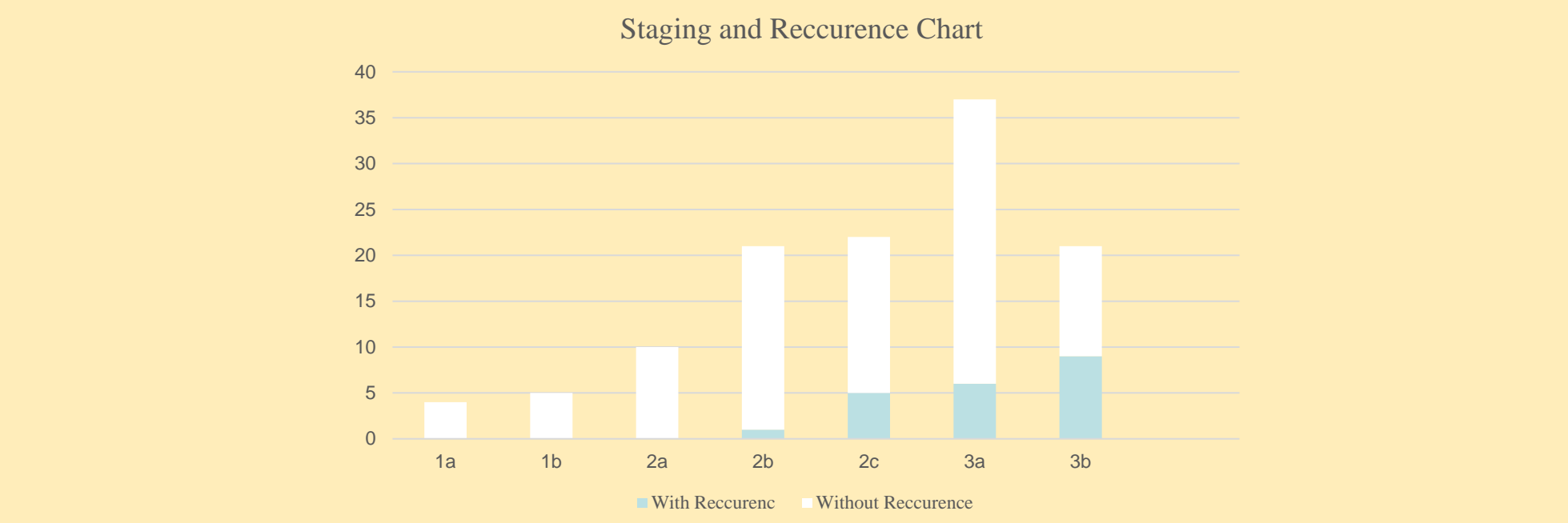
Relationship between age, tumor size, and number of surgeries with recurrence:

	Recurrence		Total	p-value
	Yes (n=21)	No (n=99)		
Age (years)	17.0 (6.0)	16.0 (6.0)	18.35±6.81	0.760*
Tumor size	5.40±2.48	5.52±2.21	5.83±4.25	0.839**
Number of surgeries	2.0 (1.0)	1.0 (0)	1.35±0.71	<0.001*

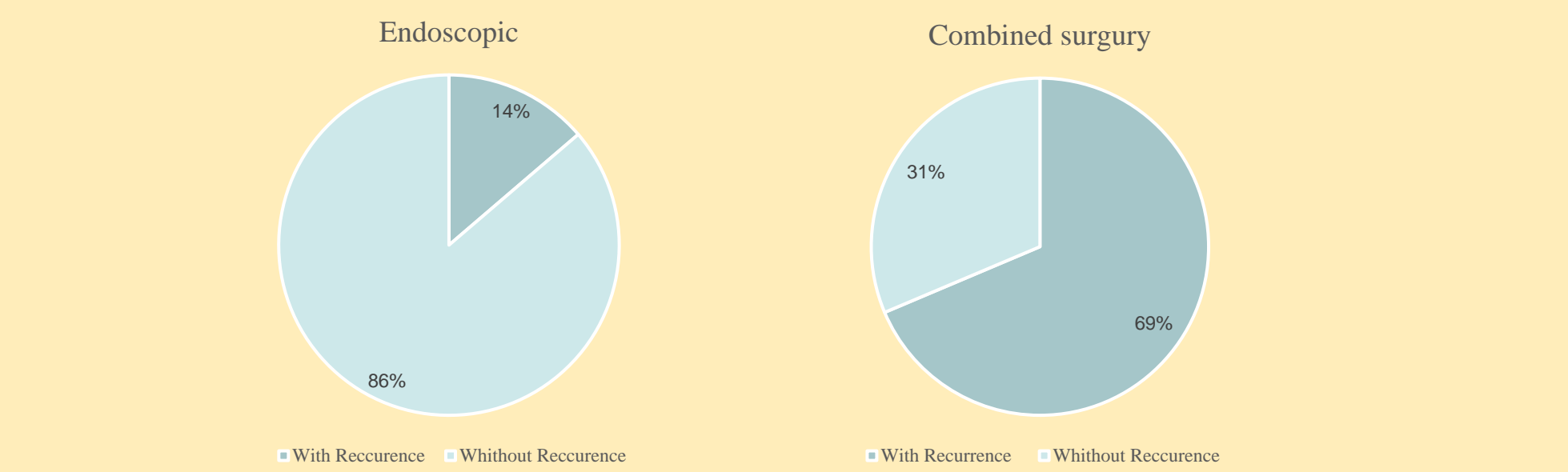
Patients based on Radkowsky staging:



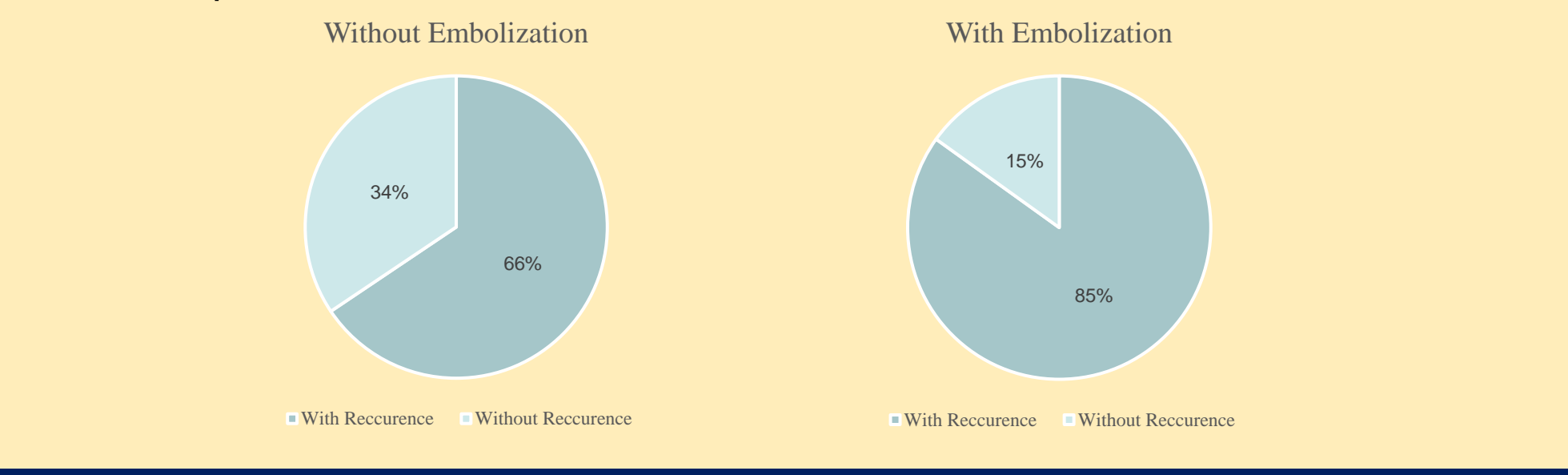
Relationship between staging and disease recurrence:



Relationship between surgery type and disease recurrence:



Relationship between embolization and disease recurrence:

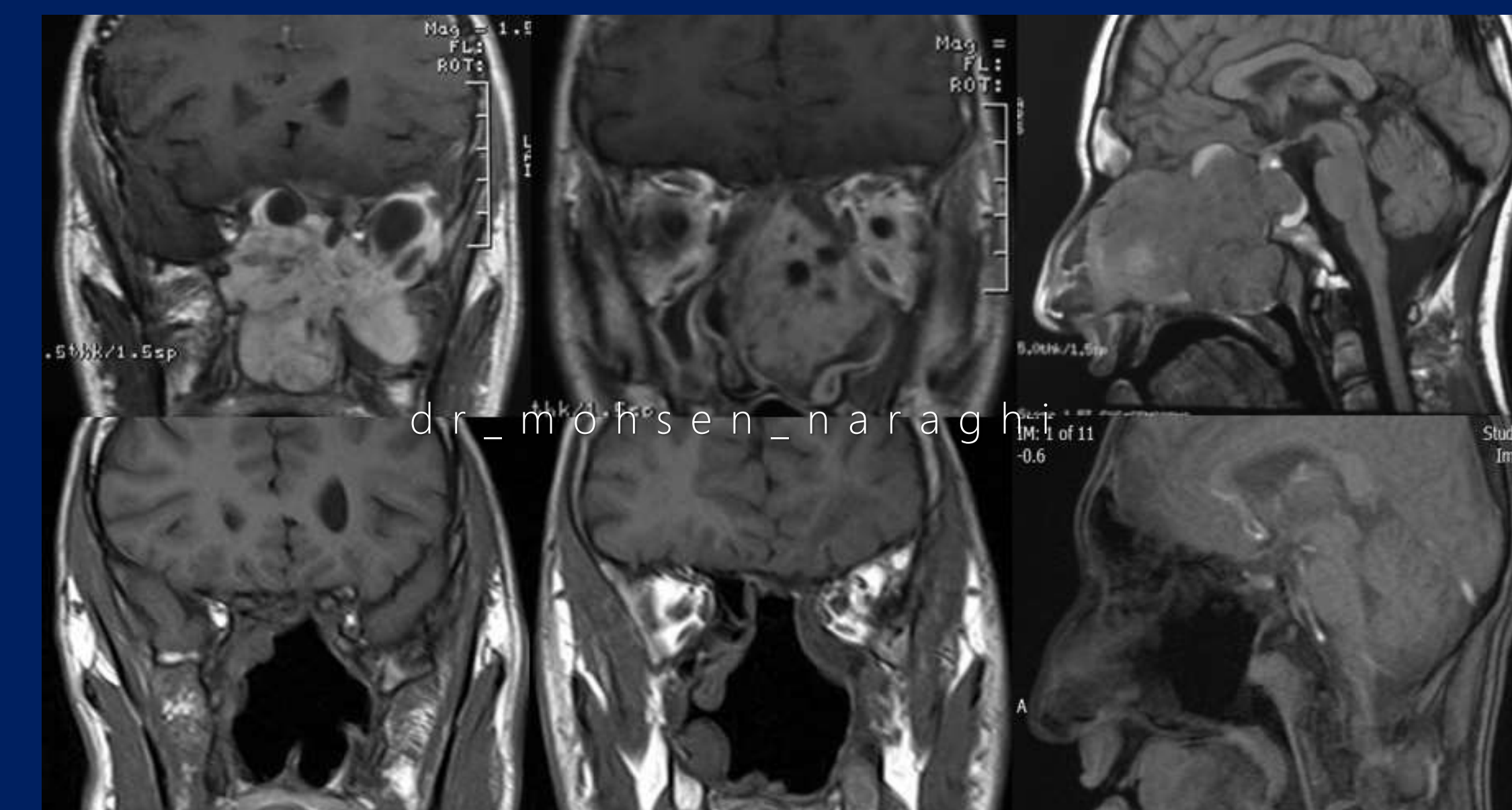


Relationship between residue and disease recurrence:

	Recurrence		Total (n=120)	p-value
Residue	Yes (n=21)	No (n=99)		
Yes	2 (20.0)	8 (80.0)	10 (100)	0.557*
no	19 (17.3)	91 (82.7)	110 (100)	

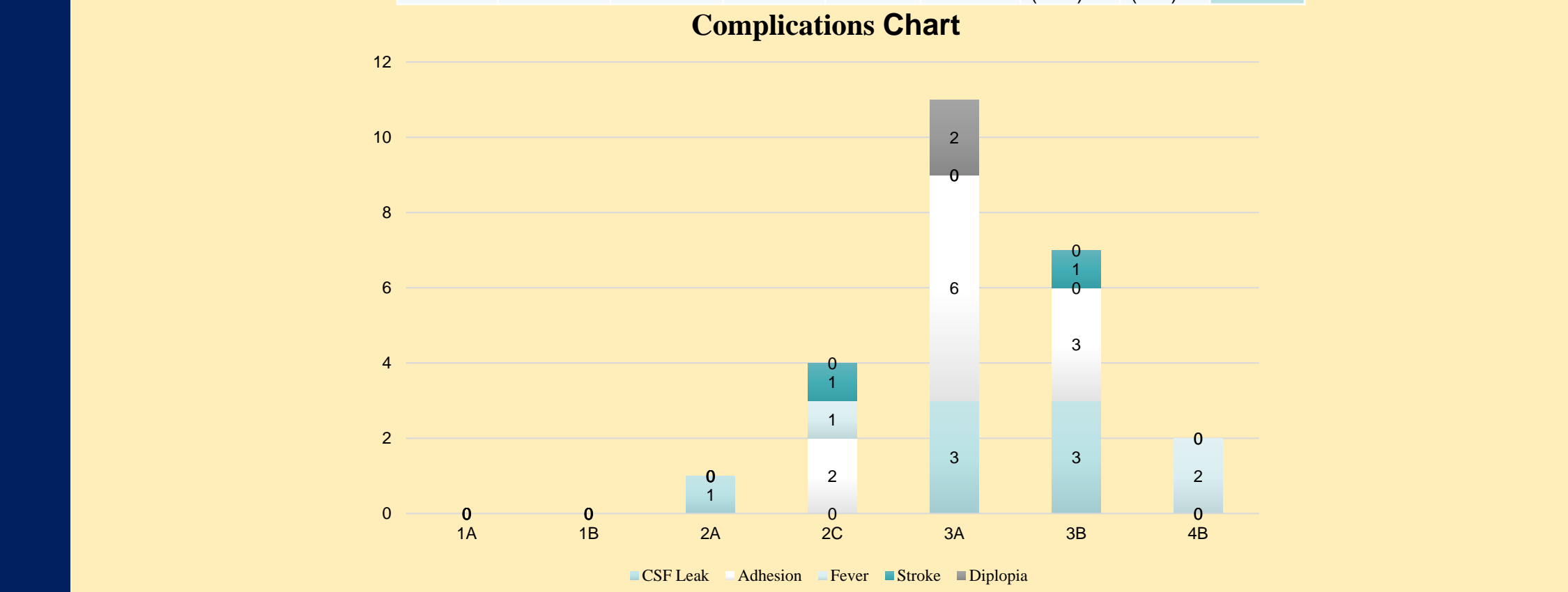
Relationship between staging and multiple recurrences::

stage	Episodes of recurrence	Total
2b	2	4
3a	0	2
3c	2	2
3b	2	2
Total	4	6

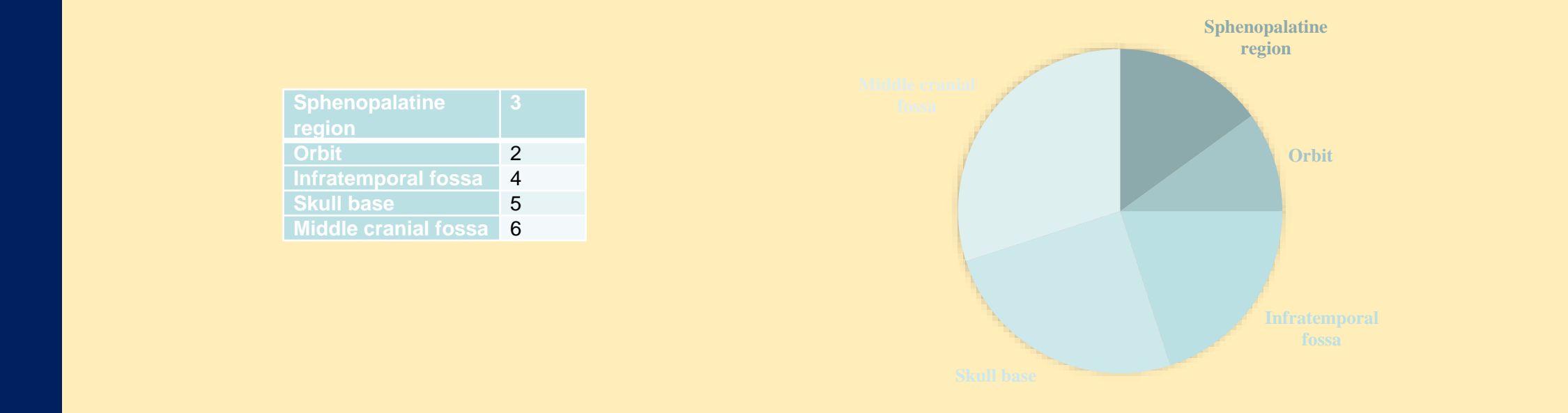


Relationship between complications and staging:

Disease staging	Complications						Total	p-value
	CSF leak	Adhesion	Fever	Stroke	Diplopia	Non		
1A	0 (0)	0 (0)	0 (0)	0 (0)	4 (100)	4 (100)	4 (100)	0.436**
1B	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	5 (100)	5 (100)	
2A	1 (10)	0 (0)	0 (0)	0 (0)	0 (0)	9 (90.0)	10 (100)	
2C	0 (0)	2 (9.1)	1 (4.5)	1 (4.5)	0 (0)	18 (81.8)	22 (100)	
3A	3 (8.1)	6 (16.2)	0 (0)	0 (0)	2 (5.4)	26 (70.3)	37 (100)	
3B	3 (14.3)	3 (14.3)	0 (0)	1 (4.8)	0 (0)	14 (66.7)	21 (100)	
4B	0 (0)	0 (0)	2 (8.5)	0 (0)	0 (0)	19 (90.5)	21 (100)	



Areas involved in patients with recurrence::



CONCLUSIONS

The recurrence rate was associated with the advanced tumor stage at the time of diagnosis and intracranial extension of the tumor. All patients diagnosed with angiofibroma should be investigated with imaging methods, such as computed tomography, to determine the stage of the tumor before surgery, and patients with intracranial involvement should be followed more closely. Selective preoperative arterial embolization is used to reduce bleeding during surgery but has nothing to do with tumor recurrence rate. Transnasal endoscopic procedures remain the method of choice for fewer recurrences and local adverse events such as scar formation and length of surgery.

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