ROLE OF PREOPERATIVE EMBOLIZATION IN SURGERY FOR NASOPHARYNGEAL ANGIOFIBROMA: A FIVE YEARS EXPERIENCE

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ABSTRACT

Background: Nasopharyngeal angiofibroma is extremely vascular, locally invasive and aggressive tumor. Among all neck and head tumors, NA prevalence is 0.05 percent to 0.5 percent but its most frequent tumor of the nasopharynx and virtually affects the male adolescents only. Nasopharyngeal angiofibroma shows a strong propensity to bleed in the surgical procedure. Currently, preoperative embolization is frequently utilized to reduce such intraoperative blood loss.

Objective: The objective of the study was to assess the role of preoperative embolization in surgery for nasopharyngeal angiofibroma among patients.

Method: It was cross-sectional descriptive study in which 60 patients with nasopharyngeal angiofibroma admitted in ENT Department of Lahore General Hospital Lahore were included. Data was collected through proforma which was entered into computer software SPSS version 22.0.

Results: Among 60 patients, 63.3% were 12-14 years old. All (100.0%) patients had nasal bleeding and nasal obstruction, 10.0% had proptosis and 18.3% patients had broadening of nose. Among patients, 65.0% had 100-200 ml peroperative bleeding and 76.7% had 4-5 days hospital stay.

Conclusion: Study concluded that preoperative embolization reduces the peroperative bleeding and hospital stay among patients.

Keywords: Preoperative embolization, nasopharyngeal angiofibroma, nasal obstruction, blood loss, hospital stay.

INTRODUCTION

Nasopharyngeal angiofibroma (NA) was first described by the Hippocrates 5000 years Before Christ but it was initially named by Friedbirg during 1940.[1] It is extremely vascular, locally invasive and aggressive tumor.[2] Among all neck and head tumors, NA prevalence is 0.05 percent to 0.5 percent but its most frequent tumor of the nasopharynx and virtually affects the male adolescents only.[3] The NA initiated from sphenopalatine foramen superior margin, normally extend to infratemporal and pterygopalatine fossae.[4]

The JNA (juvenile nasopharyngeal angiofibroma) is believed benign histopathologically, however, it behaves like locally sadistic neoplasm that can antagonistically wear away neighboring cartilage, bone, soft tissue and could aggravate complications caused by extension to orbit in about thirty percent while 10 to 20 percent intracranial invasion among all tumors. These tumors malignant alteration is not common.[5]

For nasopharyngeal angiofibromas, numerous grading systems are available along with Fisch which is mostly commonly used grading system.[6]

The sign and symptoms ranges from the unilateral nasal impediment, damaged nasal drainage, recurrent epist axis and unusual engagement of adjoining nasopharyngeal structures – hearing loss or hearing worsening, involving Eustachian tube, deformation of hard palate, hyposmiaoranosmia and rhinolalia. Generally physical finding is smooth lobulated ruddy tumor collection.[7]

Tumor is histopathologically consisted of randomly arranged vascular canals contained by thick paucicellular fibroblastic stroma, with myofibroblast being main cell. These tumors bleeding tendency is caused by the findings that small arteries in lesion center tend to require muscular elastic lamina, inclining arteries without muscular adjoining layer which could otherwise help in the vasoconstriction of uncontrolled blood loss. Blood supply to lesions is based on internal maxillary vessel, a branch of external carotid vessel.[8]

For juvenile angiofibroma, surgery is considered a treatment of choice. Preoperative assessment includes computed tomography scan for paranasal sinuses. For melanoma with orbital extension or intracranial

invasion, magnetic resonance imaging is recommended. However, there is no agreement, bilateral carotid angiography and embolization prior to surgery are suggested to decrease intraoperative blood loss and to facilitate resection, reducing surgery time, transfusion requirements and recurrence risk.[9]

Because such tumors occur from the blood vessel, hence vascular tumors embolization has got importance adjunct to surgery of such tumors. Embolization of tumors is described as obstruction of blood supply to the tumor. This obstruction if mostly carried out through endovascular technique but can also be carried out through embolic agent direct percutaneous injection in the tumor. Generally, this procedure is carried out within single session, at the same time with analytical arteriography, however, could also be carried out during multi-staged session as well.[10] Nicolai and colleagues reported reduction in intra-operative blood loss and complication among patients experienced preoperative embolization as well as decreasing residual tumor risk.[11]

Embolization must be carried out between 24 to 48 hours before operation. Generally it is affected through super-selective catheterization of the supplying main branches. The embolic material comprises PVA (poly vinyl alcohol), micro-particles, liquid glue and coils. Ethylene–vinyl alcohol copolymer demonstrates scientific benefits allowing deep infiltration in the tumor, with further huge tumor necrosis, tumor large portion embolization through smaller amount catheterizations and secure removal of catheter in spite of possible considerable reflux.[12]

Current study is carried out to assess the role of preoperative embolization in surgery for nasopharyngeal angiofibroma among patients visiting ENT Department of Lahore General Hospital Lahore.

MATERIAL AND METHODS

It was cross-sectional descriptive study in which 60 patients with nasopharyngeal angiofibroma admitted in ENT Department of Lahore General Hospital Lahore were included. Data was collected through proforma, which was entered into computer software SPSS (Statistical Package for the Social Sciences) version 22.0. The demographic data, sign and symptoms; and surgical findings were evaluated. The parameters studied were preoperative blood loss and hospital stay. Confidentiality of the data was ensured and proper consent was obtained before data collection.

RESULTS

Table-1 highlights that among 60 patients, more than half 38 (63.3%) were 12-14 years old and 17 (28.3%) were 15-18 years old while only 5 (8.4%) patients were 19-22 years old.

Table-1: Age distribution

	Frequency	Percentage (%)
12-14 yrs	38	63.3
15-18 yrs	17	28.3
19-22 yrs	5	8.4
Total	60	100.0

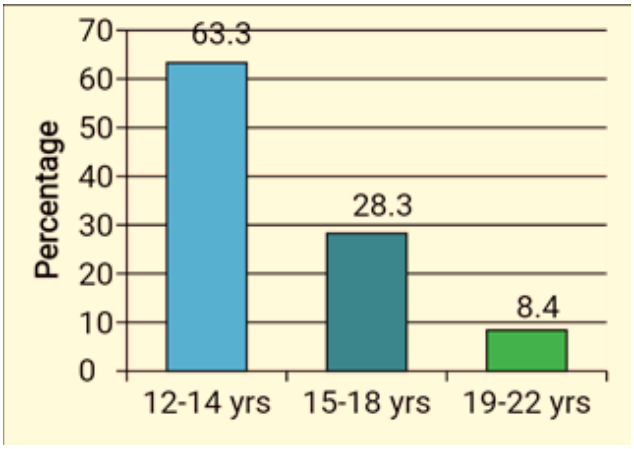

Figure-1: Age distribution

Table-2: Presenting complaints

	Yes	No
Nasal bleeding	60 (100.0%)	0 (0.0%)
Nasal obstruction	60 (100.0%)	0 (0.0%)
Proptosis	6 (10.0%)	54 (90.0%)
Broadening of nose	11 (18.3%)	49 (81.7%)

Table-3: Surgical outcome

	Frequency	Percentage (%)
Peroperative bleeding		
100-200 ml	39	65.0
201-300 ml	12	20.0
301-400 ml	5	8.3
401-500 ml	3	5.0
>500 ml	1	1.7
Total	60	100.0
Hospital stay		
Upto 3 days	9	15.0
4-5 days	46	76.7
6-7 days	5	8.3
Total	60	100.0

Table-2 describes that 100.0% patients had nasal bleeding and nasal obstruction while 6 (10.0%) had proptosis and 11 (18.3%) had broadening of nose.

Table-3 indicates that among 60 patients, 39 (65.0%) had 100-200 ml peroperative bleeding, 12 (20.0%) had 201-300 ml, 5 (8.3%) patients had 301-400 ml, 3 (5.0%) had 401-500 ml and only 1 (1.7%) patient had peroperative bleeding more than 500 ml.

Likewise among 60 patients, 9 (15.0%) had upto 3 days hospital stay and majority 46 (76.7%) had 4-5 days hospital stay while 5 (8.3%) patients had 6-7 days hospital stay.

DISCUSSION

Nasopharyngeal angiofibroma is one of the non-malignant tumors occurs in nasal cavity. It is rare and mostly appears in adolescent males. Surgical treatment is the major modality for nasopharyngeal angiofibroma. Current study assessed the role of preoperative embolization in surgery for nasopharyngeal angiofibroma among patients visiting ENT Department of Lahore General Hospital Lahore. To obtain better results, total sixty patients were included in the study and found that most of them (63.3%) were 12-14 years old and 28.3% were 15-18 years old while only 8.4% patients were 19-22 years old. But the findings of a similar study carried out by Kumar and coworkers (2018) demonstrated that majority (79.0%) of the patients were 14-22 years old while 8.1% and 12.9% were 11-13 years and 23-25 years old, respectively.[13]

It was found during study that nasal bleeding and nasal obstruction were prevalent among all (100.0%) patients and 10.0% patients had proptosis and 18.3% patients had broadening of nose. The findings of our study are comparable with a study undertaken by Muhammad and teammates (2015) who reported that 100.0% patients had nasal bleeding and nasal obstruction while there were 12.0% patients who had proptosis.[1] Another study carried out by Amer and colleagues (2016) exhibited almost similar scenario that 100.0% patients had nasal bleeding and nasal obstruction and only 5.0% patients had proptosis.[4]

When preoperative bleeding was evaluated among patients, study disclosed that mainstream (65.0%) of patients had blood loss 100-200 ml followed by 201-300 ml (20.0%), 301-400 ml (8.3%), 401-500 ml (5.0%) and >500 ml (1.7%). In our study almost among all patients the blood loss was between 100-500 ml while the results of a study performed by Leong (2015) showed that among patients the blood loss was between 400-8500 ml.[14]

As far as hospital stay is concerned, study revealed that 15.0% patients had hospital stay upto 3 days, majority (76.7%) had 4-5 days and 8.3% patients had hospital stay 6-7 days. The findings of our study are better than the study conducted by Ferreira and fellows (2006) who confirmed that 22.2% patients had hospital stay upto 3 days while none of the patients had 4-5 days hospital stay while 33.3% and 44.5% patients hospital stay was 6-7 days and more than 7 days, respectively.[15]

CONCLUSION

Study concluded that preoperative embolization reduces the peroperative bleeding and hospital stay among patients. Further studies are needed to evaluate the role of preoperative embolization in surgery for nasopharyngeal angiofibroma among patients.

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