

Outcome of Midface Degloving Approach in the management of Juvenile Nasopharyngeal Angiofibroma

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Abstract

Back ground: Juvenile nasopharyngeal angiofibroma is highly vascular tumor affecting predominantly young males. It arises from the nasopharynx. There are many procedures for treating such vascular tumor; midface degloving is one of surgical modalities of treatment.

Objective: Evaluation of outcome of 10 patients with juvenile nasopharyngeal angiofibroma treated by midface degloving approach, regarding complications, blood loss and rate of recurrence.

Design: A cross sectional study.

Setting: Department of Otolaryngology & Head and Neck Surgery, Ghazi Al-Hariri Surgical Specialties Hospital, Medical City Complex, Baghdad.

Patients and Method: This study included 10 consecutive case series of juvenile nasopharyngeal angiofibroma over a period of 3 years from 2010-2013. All patients were admitted to our ENT department. Detailed history, clinical examination and relevant investigations were done. Imaging including contrast-enhanced CT scan with MRI was done to all cases. All the patients had undergone surgical excision through midface degloving approach. Patients were regularly followed-up for any recurrence and complications for 3 years period.

Results: All patients were males and the average age at the diagnosis was 18.2 years (range 12-27 years). Nasal obstruction and recurrent epistaxis were the presenting complaints in all cases. None of the tumors were embolized prior to surgery. The overall recurrence was 10%. Majority of our patients had stage I, II, III (according to Fisch classification).

Conclusion: Juvenile nasopharyngeal angiofibroma is a highly vascular tumor of adolescent boys can be surgically excised through midface degloving approach that permit removal of tumor in toto by dissection in sub-periosteal plane and drilling the nests of tumor in basi-sphenoid and medial pterygoid plate which is mandatory to excise any residual disease and prevent recurrence of tumor.

Keywords: Midface Degloving Approach, Juvenile nasopharyngeal angiofibroma

Introduction

Juvenile nasopharyngeal angiofibroma is a rare benign fibro vascular, locally aggressive tumor found exclusively in males, most often during adolescence or young adulthood. The tumor accounts for less than 0.5% of all tumors of the head and neck⁽¹⁾. It originates in the basi-sphenoidal suture just superior to the sphenopalatine foramen and can extend to the posterior choana, the pterygopalatine fossa, infra-temporal fossa, and following preformed pathways, the orbit, and occasionally the cranial cavity⁽²⁾.

Unilateral nasal obstruction and epistaxis are the most common heralding symptoms of small tumour. In advanced lesions, swelling of the cheek, proptosis, or

headache may be present, indicating an involvement of the infra temporal fossa, orbit, or the cranial fossa, respectively. Other signs and symptoms like diplopia, pain in the cheek, sinusitis, hearing loss (unilateral middle ear effusion)⁽³⁾. Typically, the angiofibroma appears as reddish-gray sessile, smooth lobulated, hyper vascularized polypoidal mass "originating" behind the middle turbinate which is usually laterally displaced against lateral wall⁽⁴⁾.

A computed tomography (CT) scan is the preferred imaging evaluation as it provides an accurate depiction of the vascularity and stage of the tumor. MRI complemented CT in cases of intra cranial, intra orbital or infra temporal extension⁽⁵⁾. Fisch classification is the most robust and practical staging system as it defines

clinically which tumor needs limited resection and which tumor needs more extensive approach⁽⁶⁾.

Surgery is the treatment of choice for angiofibroma⁽⁷⁾. The options for approaching angiofibroma include open approaches: transpalatal, lateral rhinotomy, midface degloving, infra temporal fossa approach and endoscopic endonasal techniques⁽⁸⁾. Most surgeons now adopted technique of midface degloving for resection of angiofibroma⁽⁹⁾. Using this exposure, anterior, medial, lateral and posterior walls of maxillary antrum can be removed, this produces very large cavity that is confluent with nasal cavity and postnasal space and control of blood supply and give adequate access for tumor removal⁽¹⁰⁾. Intra operative bleeding may occur in any of the approaches. Preoperative arterial embolization is not a routine, because of high cost, not always available and is contributory cause of recurrence⁽¹¹⁾. External carotid artery ligation or temporary clamping can be used as alternative to embolization. Radiotherapy is reserved for the unresectable lesion. Angiofibroma is notorious for high rate of recurrence which is related to tumor growth at the time of surgery combined with incomplete surgical excision⁽¹²⁾.

Patients and Method

Case series of 10 patients with juvenile nasopharyngeal angiofibroma over a period of 3 years between 2010-2013. Patients were regularly followed-up for any recurrence and complications for 3 years period. All patients were admitted to the Department of Otolaryngology and Head and Neck surgery of Ghazi Al-Hariri Surgical Specialties Hospital, Medical City Complex, Baghdad. Detailed history, clinical examination and relevant investigations were done. CT scan with I.V contrast and MRI were done to all patients. Preoperative blood transfusions were donated to those patients who were anemic, while 2-3 pints of fresh blood were arranged to replace blood loss during surgery. Preoperative embolization was not done to any patient. All patients were included were younger males, with age range from 12-27 years with mean age 18.2 years. Fisch staging was selected. Personal data, clinical features, tumor extension, investigations, imaging studies, postoperative complications, follow-up time, and presence of tumor recurrence were recorded on pre-designed questionnaire. Surgery was selected as the primary treatment modality in all patients. The surgical approach adopted in our study was the midface degloving approach. Histopathology used to confirm the diagnosis of excised tumor. None of the patients received adjuvant treatment such as hormonal therapy, chemotherapy or radiotherapy. Follow-up of patients was done endoscopically (two weeks postoperatively, monthly for the next 6 months and annually for 3years) and radiologically by CT imaging with I.V contrast which was performed annually for 3years.

Method

All our patients were treated surgically, as the primary modality of management. The surgical approach adopted in 10 patients was midface degloving approach.

Preoperative management

Consent was taken from the patient and family. Anemia was corrected before operation for two patients, and prepared at least 1-2 pints of cross-matched blood for operation. Patients were warned of possible postoperative facial bruising and swelling (which may take days to resolve) and temporary paresthesia in the distribution of infraorbital nerve with nasal crusting might occur.

Position

All patients were placed in supine revers-Trendelenburg position (15°-head up tilt).

Anaesthesia

All patients were operated upon under general anesthesia. Vasoconstriction of soft tissues of nose is facilitated by placing ribbon gauze soaked in 1:1000 adrenalin intranasally and injecting 1:200,000 to the incision sites. Bilaterally temporary tarsoraphy was done.

Closure

BIPP pack was used. Closure of the sublabial and vestibular incisions was done with care using fine plain catgut, and frenulum must be correctly repositioned in the midline. Taping of nose and nasal splint was used to decrease facial edema.

Postoperative management

Monitoring of vital signs, oximetry, and neurologic status in first 24hours. Prophylactic broad spectrum antibiotic cover was used. Early liquid diet is encouraged in the first postoperative day, then advanced to a regular diet were continued. Intraoral wounds mandate the use of antiseptic mouth washes (e.g. Chlorhexidine gluconate). BIPP pack was removed after 5-7days, patients were advised to use saline sniffs 3-4 times/ day until the nasal crusting settles.

Results

- All the patients operated upon for nasopharyngeal angiofibroma were males with age ranging from 12-27years and a mean age of 18.2years.
- All of them presented with recurrent spontaneous epistaxis (100%) and unilateral nasal obstruction (90%). Other symptoms included headache & decreased hearing (10%).

- Important signs on clinical examination included mass in the nose/or nasopharynx (100%), retracted ear drum (10%), cheek swelling (20%), palatal displacement (10%), broadening of the nose (10%).
- All patients underwent contrast enhanced CT for the initial assessment and MRI was also obtained. None of the patients underwent angiography.
- One patient was stage (I), 8 patients were stage II, one patient was stage III. None of the patients had stage IV disease in this case series (according to Fisch classification).
- Regarding duration of symptoms, for recurrent epistaxis (2 weeks-5 years), for nasal obstruction (2years).
- In this study 8 of patients showed left sided tumor (80%). While 2 patients showed right sided tumor (20%).

Histopathology

Biopsy was done for all patients postoperatively. All of them confirmed the diagnosis (100%).

Blood loss

Mean blood loss during operation was about 500 mL (which was assessed roughly by the volume of blood in the jar of sucker and number of packs), which was replaced by giving 1-2 pints of blood intra operatively.

Postoperative Complications

Although the tumor is vascular one, no postoperative bleeding was reported in our study. Some of the complications related to surgical approaches which were temporary like nasal crusting which was treated with frequent nasal irrigation with normal saline. Others like paresthesia of infraorbital nerve distribution in one patient which relieved later on spontaneously. Temporary facial swelling & bruising for all patients which fade-out within 5-7 days. Epiphora developed in one patient which was managed by ophthalmologist. No hemorrhage or infection were reported postoperatively.

Recurrence

One patient (10%) had developed recurrence after one year of first surgery and he was operated upon by same approach in second operation

Discussion

Age and sex

All patients were male with age ranged from 12-27 years with mean age of 18.2 years. The highest incidence was at 16-20 years (60%). Cansiz *et al* (2006): patient's age ranged from 9-26 years with mean age of 14.9 years⁽¹³⁾.

Nong *et al* (2006) and Mistry *et al* (2005) the age of patients ranged from 13-24 years with mean age of 16.3 years^(14, 15). Ondrey FG *et al* (2003): the mean age being 14 years⁽¹⁶⁾ Pradhan B (2009): age ranged from 15-30 years with mean age of 18.25 years⁽¹⁷⁾. Twu CW (2002): the age of patients range from 11-37 years and the mean age at diagnosis was 18.5 years⁽¹⁸⁾.

Symptoms and Signs

In our study most of patients presented with recurrent spontaneous epistaxis (100%), nasal obstruction (90%) and mass in the nose/or nasopharynx (100%), headache (10%), deafness (10%), retracted eardrum (10%), cheek swelling (20%), palatal displacement and broadening of nose (10%).

Marfani MS, *et al* (2009): (100%) presented with epistaxis, nasal obstruction in (87.5%) were the two most common presenting symptoms, (100%) of patients had nasopharyngeal mass⁽¹⁹⁾. Malik MK (1991): Stated that the predominant symptoms were epistaxis and nasal obstruction⁽²⁰⁾. Bricknell MC (1992): Stated that the usual presentation is either nasal obstruction or epistaxis⁽²¹⁾.

Staging of the patients

The patients were staged according to Fisch classification. In this current study one patient was stage I, 8 patients were stage II, one patient was stage IIIA, none of the patients had stage IV in this case series. Mistry RC, Gupta S, *et al* (2005): More than (90%) of patients had stage II or IV disease⁽¹⁵⁾. Shamim AA (2013): According to Andrews staging (Modified Fisch) stage I (22.22%), stage II (22.22%) stage III (27.5%), stage IV (22.22%)⁽²²⁾. Pradhan B *et al* (2009): 23 patients, 2 patients with stage I, 9 patients had stage II, other 12 patients had stage III tumor⁽¹⁷⁾.

Side of the tumor

In this study 8 of patients were left sided tumor (80%) while 2 patients were right sided tumor (20%). Pradhan B (2009): In 13 patients the tumor was located in the left side (56.5%) while in 10 patients it was in the right side (43.5%)⁽¹⁷⁾.

Midface degloving approach

It provides good exposure to nose, maxillary antrum, pterygopalatine and infratemporal fossa. This approach is alternative to lateral rhinotomy as it gives good exposure and because of sub labial incision; there will be no deforming scar on face but needs extensive removal of bones from the anterior, posterior, medial and lateral walls of the maxillary antrum. Because of less chances of the development of facial asymmetry, mid facial degloving approach was selected in the majority of patients with advanced disease by Cansiz *et al* (2006)⁽¹³⁾.

Recurrence

One of our patients developed recurrence (10%). Recurrence is by far the most common complication encountered and is reported in up to (25%) of patients regardless the method of treatment^(7,12). Andrews, *et al* (1989): Reported that recurrence should be more properly a persistent disease reseating from incomplete previous resection⁽²³⁾. A mean recurrence rate of (32%) to as high as (40-50%) in the cases of skull base invasion has been reported⁽²⁴⁾.

Blood loss

Despite the juvenile angiofibroma is a vascular tumour, the amount of blood loss was mild to moderate during midface degloving surgery. Most patients did not need more than 1-2 pints of blood perioperative. No preoperative embolization or ipsilateral external carotid artery ligation was done. Sub periosteal dissection of tumor is the key step in reduction of bleeding during operation. Twu CW, *et al* (2002): The average surgical blood loss among those who received preoperative embolization was 969mL. For those who did not undergo embolization the loss was 3350mL⁽¹⁸⁾. Wormald and Douglas (2006): Stated that preoperative embolization reduces intra operative blood loss to less than 1000mL⁽²⁵⁾. Pradhan B, *et al* (2009): Stated that patients with embolization had blood loss about 100-200mL during surgery, those without embolization had blood loss about 500-800mL⁽¹⁷⁾.

Conclusions

From this study we concluded that Midface degloving approach provides good exposure to nose, maxillary antrum, pterygopalatine and infratemporal fossa and because of sub labial incision, there will be no deforming scar on face and less chances of the development of facial asymmetry.

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