

Overview of the Head and Neck Hemangiomas: a 5-year Retrospective Study

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ABSTRACT

Background: Infantile hemangiomas (IHs) are benign vascular tumors commonly observed in children. The pathogenesis of hemangiomas is complex and poorly understood. IH occur most commonly on the head and neck. There are different classification of them according to the depth, number, distribution and locations. A multidisciplinary approach is needed for the diagnosis and treatment of hemangiomas because it is easy to misdiagnose or decide on a wrong treatment in the existing single-treatment system. **Objective:** In this retrospective study between 2018 and 2022 we provided an overview of the hemangiomas located in the head and neck in 232 patients, and the different treatment approaches used. **Results:** Of the 232 patients 60.3 % were females and 38.7% males. The youngest age was 10 weeks old and the oldest age who underwent treatment was 79 years old. The most common lesion sites were the mid-cheek, the upper lip and the upper eyelid. 104 patients (53.4 %) underwent surgical intervention due to the location of the lesion, size and functional reasons. Meanwhile 128 patients (46.6 %) were observed and treated with propranolol and pulsed dye laser. **Conclusion:** Hemangiomas are generally benign tumors. Hemangiomas present a number of diagnostic and therapeutic challenges; thus, early diagnosis by a specialist clinic is key in preventing associated morbidity with these vascular tumors.

Keywords: Head and Neck hemangiomas, diagnosis and treatment of hemangiomas.

comprising 7% of all benign tumors, which appear during 1 to 4 weeks of life (1). Hemangiomas have a higher incidence in females and premature infants (2). IH occur most commonly on the head and the neck area (3). Lesions on the trunk accounts 25% of cases, and the extremities are least commonly, 15% of cases (3, 4). The vascular tumors mostly present as a single localized cutaneous hemangioma but infantile hemangioma may be multifocal or segmental. Hemangiomas can be superficial, deep or mixed with components of both superficial and deep layers. Superficial lesions involve the superficial dermis and are raised, lobulated and bright red. Deep hemangiomas, also called subcutaneous hemangiomas, arise from the reticular dermis and/or the subcutis layer, and appear as a bluish-hued nodule, plaque or tumor. Mixed hemangiomas have features of both locations.

The tumor has 3 phases (proliferative phase), in the first few months it grows rapidly then stabilizes. In the (Plateau phase) the lesion remains stable and quiescent for a period of months (between 6 and 12 months of life). After the first year, begins a slowly regression that can last throughout childhood (involuting phase) (5, 6). This may occur within the first year of life and can continue for several years. The regressive hemangiomas become softer and more compressible, and the color changes from bright red to purple or gray. Even though it is possible for hemangiomas to regress completely, redundant lesions of various types: scars, discoloration, and telangiectasias persist in a significant number of patients (involved phase). Because of the benign course described above, most hemangiomas (especially smaller ones and those lo-

1. BACKGROUND

Parathyroid. Infantile hemangiomas are the most common benign tumor in children

cated in non-cosmetically-sensitive areas) do not require treatment and can be managed by observation (7). Careful observation is recommended during the proliferative phase where complications - such as ulceration, pain, functional impairment are often seen. Deep hemangiomas tend to proliferate for a longer period.

Hemangiomas are heterogeneous in their appearance and have further been classified according to their depth, number, distribution, and, sometimes, location. Superficial hemangiomas or superficial "strawberry lesion" are non invasive hemangiomas, that involve only the skin and will remain relatively flat throughout their growth phases, show spontaneous involution by 4-5 yrs of age (6, 8). Cavernous hemangiomas involve both the skin and subcutaneous tissue while deep hemangiomas involve the subcutaneous surface and not the overlying skin. Also the mixed type has superficial elements and also involving deep tissue components.

Another classification of hemangiomas divided them into focal and segmental disease. Focal hemangiomas are localized, unilocular lesions which adhere to the phases of growth and involution (9). Multifocal hemangiomatosis also exists in a small percentage, and infants with more than five lesions should undergo workup to rule out visceral involvement. Segmental hemangiomas are more diffuse plaque like, involve a broad anatomic unit and can lead to untoward functional and aesthetic outcomes.

2. OBJECTIVE

In this retrospective study between 2018 and 2022 we provided an overview of the hemangiomas located in the head and neck in 232 patients, and the different treatment approaches used.

3. MATERIAL AND METHODS

After institutional review board approval, we retrospectively reviewed the medical records of 232 patients diagnosed with soft tissue Hemangioma of the head and neck region, from January 2018 to December 2022. Data were collected from the medical records on patient's charts at the department of Burns and Plastic Surgery, Pediatric Surgical Unit and Department of General Surgery at "Mother Teresa" University Hospital Center in Tirana, Albania. Formal approval from Ethics Committee of Mother Teresa Hospital was obtained. The charts of each patient were examined for the following factors: age, gender, type of vascular malformation, anatomical region and medical specialty in charge of treatment and duration (follow-up) of treatment. The patients who were lost to follow-up were excluded from the study. The treatment sessions were performed under general anaesthesia for infants and small children while intravenous sedation was used for older children. The data were recorded in an Excel program and analyzed using the SPSS statistics program.

4. RESULTS

Our retrospective case control study included 232 cases divided in two groups depending on age, pediatric

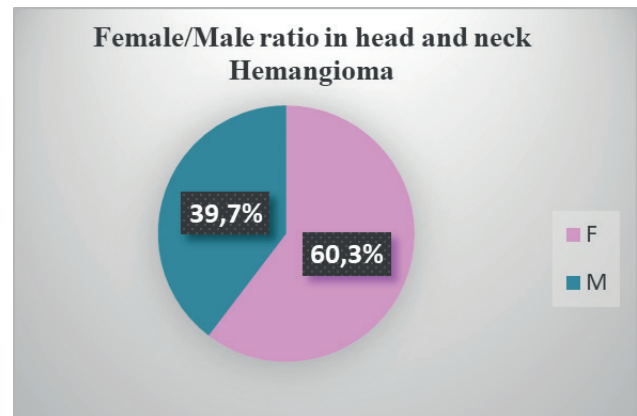


Figure 1. Distribution of head and neck hemangioma

| Description | Pediatric age | | | Adults | | |
|-------------|---------------|----|-------|--------|----|-------|
| | F | M | Total | F | M | Total |
| Population | 98 | 53 | 151 | 42 | 39 | 81 |

Table 1. Patients distribution according to age

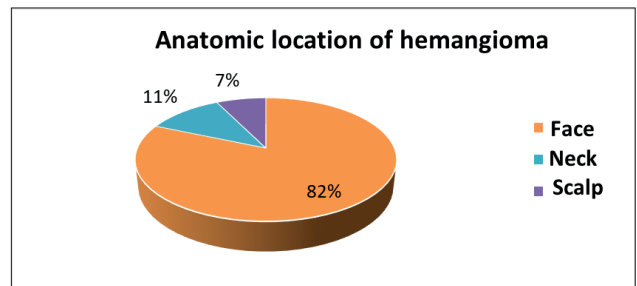


Figure 2. Distribution of Hemangioma according to anatomic location

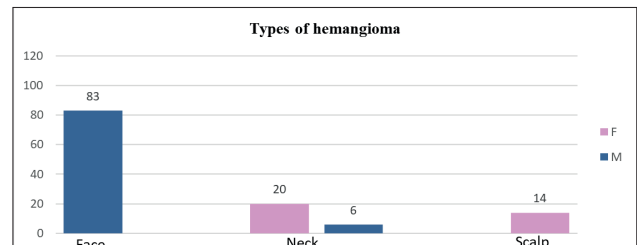


Figure 2.

group (<18 years old) and adults (>18 years old). The treatment of patients included in the study was divided between branches of surgical specialties such as pediatric surgeons, plastic surgeons, general surgeons and outpatient clinic. Of the 232 patients 60.3 % were females and 38.7% males. The mean age at presentation was 17.4, while the youngest age was 10 weeks old and the oldest age who underwent treatment was 79 years old.

According to our results most common location of hemangiomas who presented for diagnosis and treatment were the face, this is probably because of significant cosmetic reasons or functional defect. The most common lesion sites were the mid-cheek, the upper lip and the upper eyelid. 104 patients (53.4 %) underwent surgical intervention due to the location of the lesion, size and functional reasons. Meanwhile 128 patients (46.6 %) were observed and treated with propranolol and pulsed dye laser. After treatment patients showed

near complete to complete clearance of the lesion. In the patients who underwent surgical resection a remaining scar was the end result.

5. DISCUSSION

The appropriate management of vascular anomalies depends on an accurate diagnosis. Therefore it is important to differentiate between haemangiomas and arteriovenous malformations. A specific medical history and physical examination are important for the diagnosis. The rapidly proliferating nature of IHs can lead to misdiagnosis in patients with malignancy, as they may mimic dermatofibrosarcoma and infantile fibrosarcoma (9, 10). Hemangiomas can be infantile or congenital. Infantile hemangiomas are glucose transporter protein-1 (GLUT1) positive while congenital hemangiomas are not (7). A multidisciplinary approach is needed for the diagnosis and treatment of hemangiomas because it is easy to misdiagnose or decide on a wrong treatment in the existing single-treatment system.

The accurate diagnosis is based on diagnostic imaging, ultrasound (US) of the head in infants <4 months of age for large facial hemangiomas and magnetic resonance imaging (MRI) with angiography for those >4 months of age. US of an hemangioma lesion can help rule out a close differential diagnosis of vascular malformations. Hemangiomas usually have an isointense or hypointense signal on T1 images and are enhanced on T2 imaging (10, 11). Characteristic findings in US include well-defined hypoechoic, heterogeneous texture with cystic sinusoidal spaces, and fast flow pattern. Biopsy can be considered in case of lesions with unclear etiology, unusual appearances, and atypical features.

Following detection, these lesions enlarge with the patient throughout their life. Local trauma to the lesion or hormonal changes during puberty can be associated with rapid malformation growth (11,12). Close observation and intervention was recommended during the proliferation phase because the lesion may destroy or affect vital structures and function. Also, intervention may be necessary after involution when there is residual excess tissue, telangiectasia, or scarring. Head and neck hemangiomas can be difficult to treat due to their size and location, therefore during evaluation and treatment of them it is fundamental taking into account the impact of the lesion on head and neck function. There are many treatment modalities reported in the literature for head and neck haemangioma, including observation, drug therapy with propranolol, sclerotherapy, cryotherapy, isotope radiotherapy, laser therapy, and surgical therapy (13-16). American Academy of Pediatrics (AAP) guideline for the treatment of infantile hemangiomas (IH) recommends early intervention and/or referral (ideally by 1 month of age) for infants who have potentially problematic IHs. Also most hemangiomas do not require immediate treatment due to their self-involuting pattern of growth; therefore, "active observation" is recommended (10, 11). But there is no single best option for IH. Each treatment option has limited therapeutic benefit with its own side-effect profile and risks. Until recently Intralesional

steroid therapy was the first line option for nasal tip and deep parotid lesions in the proliferative phase to control accelerated growth and terrible esthetic consequences (17). But it often required multiple injections, nowadays beta-blockers, in particular, propranolol has become the first line of management of complicated IH (14-16). Lately in a randomized controlled trial of propranolol at 3 mg/kg at dosing successfully led to complete or near resolution of IH as compared with placebo, without a significant difference in adverse events. Combination therapy with oral corticosteroid and propranolol in IH treatment regimens have been investigated (16,17). The patients should be closely monitored to avoid complications such as hypoglycemia, hypotension, bradycardia, sleep disruption etc. The treatment for symptomatic deep subdermal or intramuscular hemangioma surgical excision is the preferred treatment (18,19). Laser therapy is often used as an alternative treatment for hemangiomas. Pulsed dye laser (PDL) or long-pulse Nd : YAG, which are based on the selective photothermolysis theory, are considered the most common laser therapies for hemangiomas. Combining laser therapy with other treatments has demonstrated better outcomes than a single treatment.

Prognosis of hemangioma lesions after treatment depends on the presence of any complications (20). The possible complications of infantile hemangiomas include ulceration, disfigurement, obstruction, and functional impairment. Ulceration was the most common complication in larger IHs.

6. CONCLUSION

As a conclusion hemangiomas are generally benign tumors. Hemangiomas present a number of diagnostic and therapeutic challenges; thus, early diagnosis by a specialist clinic is key in preventing associated morbidity with these vascular tumors. After a complete assessment, appropriate and individualized approach should be used to treat or prevent complications, treatment modalities are based on the presence or absence of complications.

- **Patient Consent Form:** All participants were informed about subject of the study.
- **Author's Contribution:** A.P. and E.M. gave substantial contributions to the conception or design of the work in acquisition, analysis, or interpretation of data for the work. A.P, A.K., and E.M. had a part in article preparing for drafting or revising it critically for important intellectual content. A.P, A.K., and E.M. gave final approval of the version to be published and agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.
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