



Surgical Treatment of Extensive Hemangiomas of the Neck among Children

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Abstract

Background: Treatment of hemangiomas still remains one of the urgent problems of modern medicine. The main problems of Hemangiomas are characterized by a rapid, progressive growth. Growing, they destroy surrounding tissue and cause significant functional and cosmetic damage to the patient.

Case Presentation: In this paper, for example of 14 patients with hemangiomas of the neck had been shown that the optimal treatment of hemangiomas are stage endovascular embolization followed by surgical removal of formation. In the absence of conditions for endovascular embolization and with contraindications for using of propranolol is recommended operative treatment using microsurgical techniques and bloodless technologies.

Conclusions: In control of the ultrasound examination after 1 year was performed, no recidive growth of formation. All patients were examined at various time intervals after surgery recidive growth of formation is not revealed. In the absence of conditions for endovascular embolization, if exist contraindications for the use of propranolol we prefer operative treatment using microsurgical techniques and bloodless technologies.

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Introduction

Treatment of hemangiomas still remains one of the urgent problems of modern medicine. The main problems of Hemangiomas are characterized by a rapid, progressive growth. Growing, they destroy surrounding tissue and cause significant functional and cosmetic damage to the patient [1].

Currently there are more than 50 methods of treatment of hemangiomas with different mechanisms of action [2–5]. This is due to the different localization of formations, multiple forms of their manifestations and search for optimal treatment. At the same time, the surgical method in the treatment of hemangiomas is still one of the main. In reconstructive, plastic and aesthetic microsurgery department of National Scientific Center of Surgery named after A.N. Syzganov for 2 years were operated 14 patients with hemangiomas of the neck. The age of patients ranged from 1 to 10 years. In anamnesis in 8 of them on tumors previously held several of interventions in the department of endovascular surgery (cryo, laser destruction, excision, embolization, conservative treatment by propranolol etc). 6 patients came primary diagnosis of the presence of formations was not difficult. Accompanying relatives of patients complained of the presence of large formations on the neck, changing color depending on the position of the child. 3 patients had significant limitation of movement of the head, deviation of the neck, 4 patients had pain syndrome, due to compression of the primary trunks of the brachial plexus. In all patients, the presence of hemangioma was determined during the first month of life. On examination revealed localization, prevalence and functional impairment determined by palpation symptoms "squeezing and filling". Soreness occurred in 4 patients. Pulsation determined on 5 formations. All formations were soft consistency, immobile performing imaging studies was limited. Age of children was not always allowed to perform certain research. At the same time, ultrasound, angiography, and magnetic resonance imaging were performed in all children.

Ultrasound examinations of hemangiomas were performed using high-resolution linear encoder 8 MHz. To rate blood flow was applied pulse Doppler and color mapping of the flow. With the help of electronic meters measured linear sizes of hemangiomas, and using a ruler stroke a path



Figure 1: View of patient before surgery.



Figure 2: Schematic representation of localization of hemangioma.

and calculates the area of hemangiomas. Carrying out ultrasound investigation in 14 patients with hemangiomas, allowed us to set the depth of lesion, clarify the localization of hemangioma, anatomic topographical relationship of the tumor to the surrounding tissues, degree of interest of main vessels and blood flow speed in the formation and in parenchyma. In our observations sizes of hemangiomas ranged from 5.0 cm x 4.0 cm to 17.0 cm x 9.0 cm. Formation had irregular shapes, deckle-edged. Sonographic signs of capsule were detected only in 3 cases and corresponded to cavernous forms. During Doppler ultrasound in 9 patients with cavernous and mixed hemangiomas in formations identified blood flow. It was characterized by "mosaic" view due to multiple un- and hypoechogenic areas of irregular shape with a diameter- 0.1-0.2 cm, representing the vessel lumen. With angiography identified the sources and variations of blood supply in the affected area, localization, sizes and character of vascular changes. In 4 patients formation sprouted into the surrounding tissues and had a relationship with a major vascular system, studied blood flow speed, and also 2 patients conduct differential diagnostics of complex of hemangiomas with different forms angiodyplasias. Magnetic resonance imaging performed on the MRI's magnetic field of 1.5 tesla. Scanning was planned in three mutually perpendicular planes-axial, sagittal, coronal, mode T1-T2-weighted images. On magnetic resonance imaging in all patients indicated the presence of soft tissue formation, inhomogeneous structure with hyper intense areas.

Surgery was performed under general anesthesia with the use of microsurgical techniques, increase (microsurgical loupe), microsurgical instruments and hyperfine suture material.

13 patients were performed stage endovascular embolization (up to 4-5 times) followed by excision of formation under magnification to 5 times. In these operations no technical difficulties were encountered, as hemangiomas were sclerosed. Blood loss was minimal. Difficulties were raised in the allocation of the anatomical structures of the neck from sclerosed tissue.

Case Presentation

Patient "K" 1 year 4 months has been hospitalized with the diagnosis: "Tumor formation left to neck with compression of the nerve trunks of cervical and brachial plexus". Complained on the presence of a painful neck tumor formation, labored breathing, movement disorders of the head and left upper extremity, sleep disorder.

From the words of her mother she has the formation from birth. The formation still is increasing. Over the last month pain appeared in the field of formation, labored breathing, movement disorders of the head and left upper extremity, sleep disorder. Over the entire period formation has changed color from flesh to cyanotic-purple.

locally: on the left side of the neck with the transition to the front and back surfaces has a tumor formation, rounded shape, sizes 16.0 cm x 9.0 cm, holding $\frac{1}{2}$ of the perimeter surface of the neck, purple colored, moderately painful, soft-elastic consistency, immobile, pulsing. During Valsalva probe has been a sharp expansion of the internal jugular vein. Active and passive movements of the left upper extremity are painful (Figure 1 and 2).

Besides general clinical examination conducted instrumental methods of research. Doppler ultrasound: cavernous hemangioma of the neck on the left. Common carotid artery and internal jugular vein are passable. Thoracic aortography: Angiographic picture volumetric formation of the left half of the neck (Figure 3). Magnetic resonance imaging of soft tissues of the neck: soft-tissue formation in the projection of the soft tissues of the neck on the left (Figure 4). Magnetic resonance imaging of the brain: residual signs of



Figure 3: Angiogram formation.

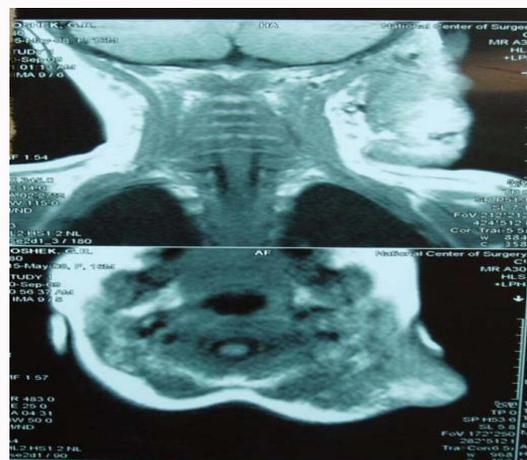


Figure 4: Magnetic resonance tomography formation.

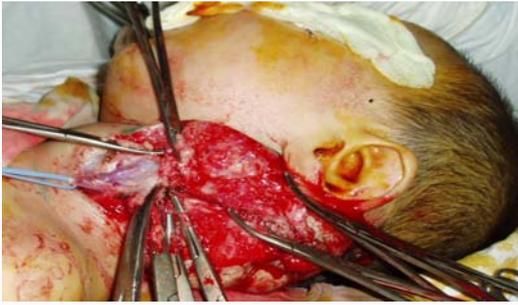


Figure 5: Stage of separation of hemangioma.



Figure 6: The tumor was removed, defect of covering tissues.

encephalopathy with unexpressed ventriculomegalia. The formation of cervical region on the left ECG result: sinus bradycardia.

Patient was examined by oncologist, cardiologist, maxillofacial surgeon, pediatrician, vessel surgeon. Consilium recommended phasing endovascular embolization followed by excision of formation.

Patient underwent unsuccessful attempt of endovascular destruction in relation with the throw back of a contrasting substance into the internal jugular vein which could worsen the condition of the child. Considering to growth of labored breathing, pain syndrome, clinic of compression the nerve trunks of the brachial and cervical plexus, been decided not to perform the second attempt of embolization and remove the formation.

Under general anesthesia using a 2.5-fold increase was performed operation: excision of tumor formation of the neck. Operation stages: after appropriate processing of the surgical field, to reduce the amount of blood loss as possible, performed finger "pushed out" of formation, while formation became flesh colored. At the base of the tumor imposed mild intestinal clamps. The skin over the bloodless formation dissected in obliquely - longitudinal direction. At revision: the formation is a cellular structure without a capsule, intimately soldered with sub clavian vein, common carotid artery to the bifurcation level, grows into the neck muscles, intimately soldered to the nerve trunks of the cervical and brachial plexus, thyroid cartilage. Tumor nourishment was carried out of the pool of the common carotid artery, branch of the thyroid-cervical trunk. Outflow of blood is carried by the supraclavicular vein (Figure 5). It was performed removal of formation with excision of superficial neck muscles, partial excision of the sternocleidomastoid, scalenes muscles. Alloying of the nourishment vessels of formation with excision of supraclavicular vein (Figure 6). Blood loss was 50 ml the resulting defect of covering tissues was removed by plastic with local tissues (Figure 7). Active wound drainage. Pathology-histological conclusion: Juvenile capillary hemangioma of the neck. Postoperatively, the patient received anti-



Figure 7: Defect removed by plastic with local tissues.



Figure 8: View of the patient, 1 year after underwent surgery.

bacterial, anti-inflammatory therapy. The general condition has stabilized. Sutures are removed on the 11th day. Child had been discharged in satisfactory condition with the recommendations.

Conclusion

In control of the ultrasound examination after 1 year was performed, no recidive growth of formation (Figure 8). All patients were examined at various time intervals after surgery recidive growth of formation is not revealed. Thus, the optimal treatment of hemangiomas is a stage endovascular embolization followed by surgical removal of formation. In the absence of conditions for endovascular embolization, if exist contraindications for the use of propranolol we prefer operative treatment using microsurgical techniques and bloodless technologies.

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