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ANALYSIS OF THE RESULTS OF SURGICAL TREATMENT OF CHILDREN WITH CONGENITAL CONCAVE DEFORMATION OF THE SCAPULA BONE

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KURAK SUYAGINING TUG'MA DEFORMATSIYASI BO'LGAN BOLALARNI JARROHLIK YO'LI BILAN DAVOLASH NATIJALARINI TAHLIL QILISH

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АНАЛИЗ РЕЗУЛЬТАТОВ ХИРУРГИЧЕСКОГО ЛЕЧЕНИЯ ДЕТЕЙ С ВРОЖДЕННОЙ ВОГНУТОЙ ДЕФОРМАЦИИ ЛОПАТКОЙ КОСТИ

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ANNOTATION

In this article, we present the results of surgical treatment of 26 children with congenital concave deformation of the scapula by using the method of surgical treatment developed by us. After the reconstruction of the scapula, good results were observed in 85.0% of patients.

Key words: Sprengel deformity , surgical treatment, reconstruction of concave deformation of the scapula.

ANNOTATSIYA

Ushbu maqolada yelka suyagining tug'ma deformatsiyasi bilan og'rigan 26 nafar bolalarni o'zimiz tomonidan ishlab chiqilgan jarrohlik davolash usuli yordamida davoladik va jarrohlikdan so’ng kuzatilgan natijalarini analiz qildik. Skapula rekonstruktsiyasidan so'ng bemorlarning 85,0 foizida yaxshi natijalar kuzatildi.

Kalit so'zlar: Sprengel deformatsiyasi, jarrohlik davolash, scapula deformatsiyasini qayta tiklash.

АННОТАЦИЯ

В статье представлены результаты хирургического лечения 26 детей с врожденной вогнутой деформацией лопатки с использованием разработанного нами метода оперативного лечения. После реконструкции лопатки хорошие результаты отмечены у 85,0% пациентов.

Ключевые слова: деформация Шпренгеля, оперативное лечение, реконструкция вогнутой деформации лопатки.

Congenital elevation of the scapula, or Sprengel deformity (SD), is a rare congenital deformity of the scapula, characterized by a violation of the lowering of the scapula to its normal position during development, which leads to hypoplasia, an elevated and malrotated type of scapula [2,8,10]. This pathology is the most common congenital anomaly of the shoulder in children and can be found in combination with

other diseases such as Klippel-Feil syndrome and scoliosis [1,3,11]. Most of the congenital elevation of the scapula occurs in females, has a mostly unilateral presentation, and is more often located on the left side.

The disorder varies in severity from slightly limited shoulder range of motion (ROM) and mild cosmetic deformity to more severe dysfunction and severe clinical abnormalities [3,5,7].

The severity of the disease and the results of treatment largely depend on the condition and change in the shape of the scapula. As it is known, in Sprengel's disease, the scapular bone is underdeveloped, deformed and adheres unevenly to the surface of the chest, which greatly aggravates the course of the disease. Therefore, for the purpose of early radical surgical intervention in children, prevention of the development of secondary deformities and the progression of the pathological process, accurate and early diagnosis of the pathology is very important.

Sprengel's disease is diagnosed on the basis of an external examination and indications of radiography, multislice computed tomography (MSCT) and electroneuromyography (ENMG). In a clinical study, complaints typical of this disease, possible factors of etiopathogenesis, deformities of the shoulder girdle and dysfunction of the shoulder girdle and joints are established. X-ray and MSCT methods, complementing each other, make it possible to objectively assess the state of the skeletal system, the relationship between the elements of the bones of the shoulder girdle of the chest and spine. With ENMG research, it is possible to clarify the state of the nerves and muscles of the shoulder girdle and shoulder. Thus, a comprehensive examination and the data obtained at the same time make itpossible to draw up a specific plan for surgical treatment in each specific case.

In the process of diagnosis and treatment of congenital high standing of the scapula in children, errors and complications are possible [3,9]. So, in newborns, the differential diagnosis of Sprengel's disease, congenital scoliosis, anomalies in the development of the cervical vertebrae and chest is difficult. Therefore, in case of suspicion of the presence of congenital anomalies in the development of the scapula of children, it is necessary to put them on a dispensary record. Patients need periodic examination every 3-6 months.

Difficulties in diagnosis arise in cases of abnormal development of the cervical and thoracic vertebrae and scoliosis. Therefore, it is necessary to study thespatial arrangement of the scapula by drawing reference lines.

Mistakes in the choice of methods of surgical treatment are possible. Although the techniques for mobilizing and bringing down the scapula do not fundamentally differ from each other with different methods, the method of

fixation of the retracted scapular bone is very important. Observations have shown that as children grow, to eliminate obstacles to bone growth, it is advisable to fix the retracted scapula to the back muscles, especially in young children. Insufficient removal of the omovertebral bone is considered an error. The remaining part of the extra bone will grow further and lead to cosmetic defects [4,6,10].

In the treatment of Sprengel deformity, we adhered to the following treatment methods:

1. If Sprengel's disease is combined with congenital muscular torticollis, surgical treatment of torticollis is first necessary. Or, in extreme cases, simultaneously with the reduction of the scapula, it is necessary to perform a myotomy of the sternocleidomastoid muscle. Otherwise, the stretched sternocleidomastoid muscle will prevent the scapula from being brought down.

2. In the case of a combination of Sprengel's disease with scoliosis, the first step is to lower the scapula. After that, the correction of spinal deformity is facilitated.

3. A combination of Sprengel's disease with an anomaly in the development of the chest and ribs is rare. At the first stage, the scapula is lowered and after that, at the second stage, plastic surgery is performed to correct the anomalies of the ribs and chest.

Aim of the study: to improve the results of treatment of children with congenital concave deformity of the scapula using the developed method of surgical treatment.

Material and methods

The study included 26 patients with concave deformity of the scapula along the length and width, aged from 3 to 11 years, who were treated in the Department of Pediatric Orthopedics of the Scientific Specialized and Practical Medical Center of Traumatology and Orthopedics of the Ministry of Health of the Republic of Uzbekistan.

Complaints of parents were mainly on the deformity of the chest, neck, spine and back, head, limitation of movements in the area of the shoulder joint and upper limb. Sometimes patients noted pain when moving in the shoulder area and numbnessof the hands.

When examining children, asymmetry of the shoulder, neck and soft tissues in the area of the shoulder joints and shoulder girdle was noted. The shoulder and shoulder girdle on the side of the lesion are raised, the transition angles from the shoulder girdle to the cervical region are smoothed.

All children underwent a clinical examination, and biochemical, radiological, MSCT, and ENMG studies.

Surgical operations were performed according to the technique developed at our Center: "Method of treating congenital high standing of the scapula in children" (positive decision for the patent of the Intellectual Property Agency No. FAP 2020 0004/6. dated 16.07.2021).

Operation technique

Anesthesia is endotracheal, the position of the patient is on the stomach. A cushion is inserted under the shoulders. After treating the back, neck, shoulder joint and upper limb with an ethanol solution of iodine, an incision is made in the skin and underlying soft tissues, starting from the acromioclavicular joint along the upper edge of the scapula, further arcuate along the medial edge up to 5-6 cm below the lower angle of the scapula and along the lateral edge up to 3 cm above the lower angle. Next, the skin-subcutaneous flap is separated, starting from the medial edge of the scapula to the lateral edge. Hemostasis is performed. The mobilization of the scapula is performed, starting from the medial edge and the upper angle in the direction of the lateral edge subperiosteally. For this, the trapezius muscle, the rhomboid muscle and the muscle that lifts the scapula are dissected. After that, the subscapularis and anterior serratus muscles are cut off along the medial edge of the scapula. Careful hemostasis with a coagulator or suturing of bleeding vessels is performed.

Certain difficulties are caused by the isolation of the omovertebral bone in skeleton forms of the disease. Additional bone is carefully isolated from the surface of the chest and cut off from the medial edge of the scapula. After complete exposure, the omovertebral bone is dissected from the spine. Then the fibrous bands are excised.

In cases of soft tissue cords or synchondrosis, the cords or sections of cartilage tissue are dissected and the omovertebral bone is removed. If the accessory bone is fused by synostosis, an osteotomy is performed along the medial edge of the scapula and the omovertebral bone is exposed.

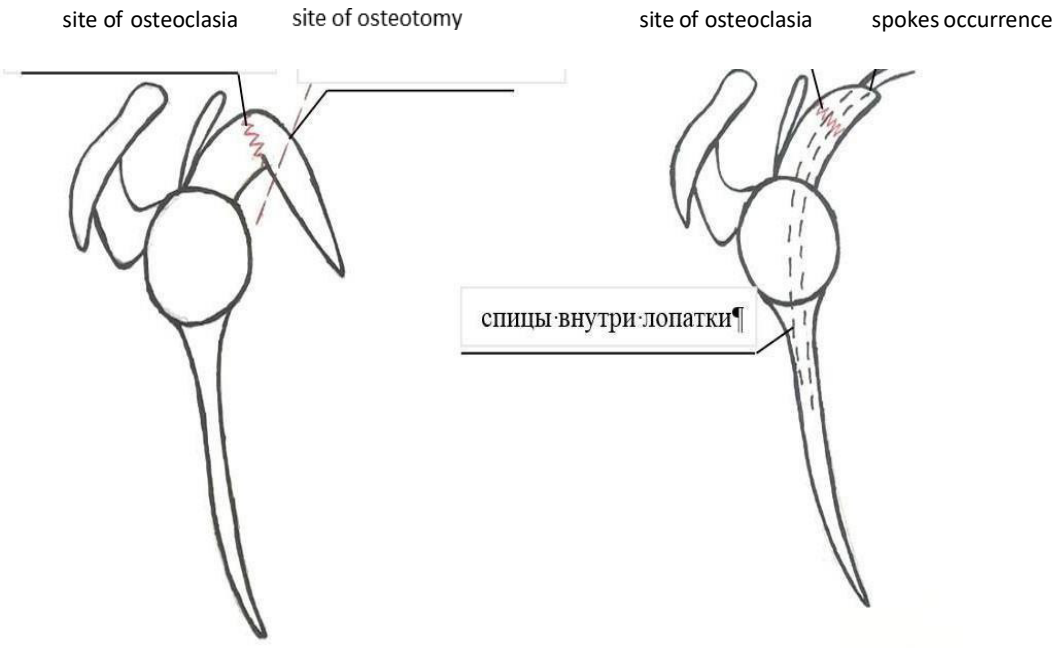
In mixed deformities of the scapula, the proximal section is curved, theconcave deformity of the body or the deformity of the medial edge is bent outward.In these cases, the proximal section is corrected first, then the concave deformity isdone. However, the scapular bone is not always corrected with a bone holder. Therefore, in children older than 10 years, a corticotomy of the inner cortical plate of the scapula is performed in the horizontal or vertical plane, depending on the deformity, and then corrected with bone holders by breaking the outer plate.

Further fixation is carried out with two Ilizarov needles according to the method described above.

After complete mobilization of the scapula, a trial retraction of the scapula and rotation around the axis outwards was performed to eliminate rotation. If bringing down and rotation is prevented by the muscles and ligaments attached to the coracoid process, which is determined by the presence of spring resistance from the outer upper angle subperiosteally, the coracoid process was isolated and osteotomy was performed.

After that, the scapular bone is reduced to a normal level - the upper edge of the scapula is at the level of the lower edge of the II thoracic vertebra. Further along the posterior scapular line, a pocket is formed in the latissimus dorsi muscle, the scapula is lowered and, immersing its lower corner in the pocket, it is transosseous fixed to the muscle with three or four U-shaped lavsan sutures. Similarly, the medial edge of the scapula is fixed to the trapezius muscle with U- shaped lavsan sutures. After control of hemostasis, the wound is sutured in layers. Two rubber outputs are inserted along the upper and medial edge of the scapula.

The wires are removed after the wound has healed during the removal of the sutures on days 12-14 after the operation with two crosswise Ilizarov wires, with one wire being inserted from the upper medial angle down and outward, the secondfrom the upper lateral part of the upper edge down and inwards (Fig.1).



A. B.

Fig.1 Scheme of the operation of bringing the scapula down with reconstruction of the concave deformity of the scapula.

Results and discussion

Biochemical blood tests were performed in all children. In 7 patients, an increase in enzymes (ALT and AST in the blood) was found, in 12 - a decrease in blood proteins. Violation - a decrease in the blood coagulation system was detected in2 patients who received appropriate treatment after consultation with pediatricians and hematologists.

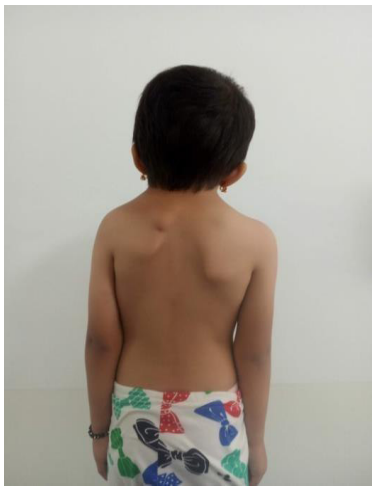
At admission, all patients underwent X-ray examinations of the chest and upper limb to detect pathological changes in the bones of the chest and shoulder girdle.

In 11 children, an anomaly in the development of internal organs was found. In particular, 4 children have congenital heart disease, 12 have neurogenic disorders of the brain, 5 have various vascular pathologies. Thymomegaly was noted by us in 2 cases.

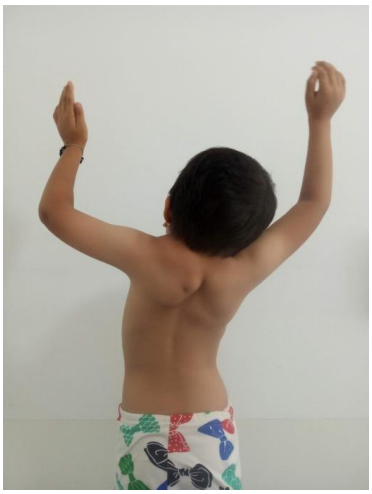
Clinic example

Patient Mukhtorzhonova G., 5 years old, history. disease No. 4187, was admitted to the clinic on September 7, 2020 with complaints of deformity of the chest, spine and limitation of movements in the left upper limb (Fig. 2 A, B, C). The patient was examined in the clinic and diagnosed with Sprengel's disease on the left, bone, severe form, (Klippel-Feil's disease) left-sided scoliosis of the cervicothoracic spine of the second degree, anomaly of the vertebrae and ribs, synostosis of the cervical and thoracic VC1-6, VTh1-2, cleft of the arches VC4,C5, C6 of the spine. (Fig. 2 D - X-ray, E - MSCT, F - front view, G - rear view, H,I - front view. The result of treatment after 1 year was noted by us as good.

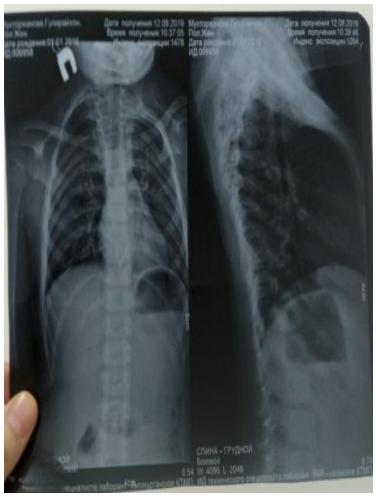
A



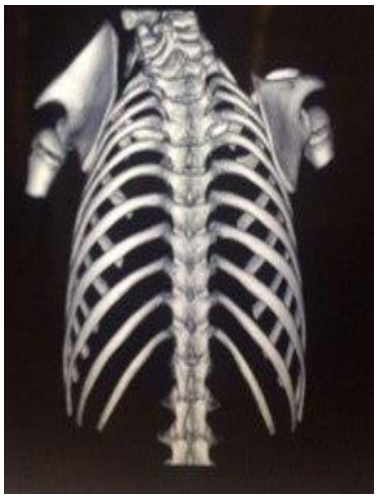
B



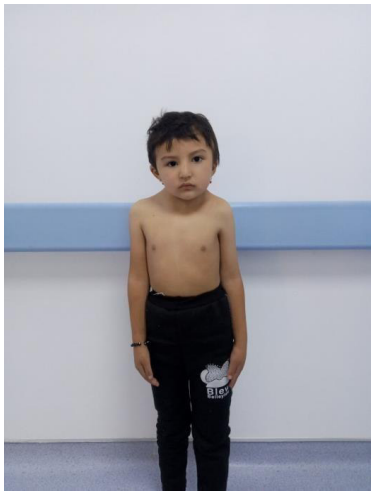
C



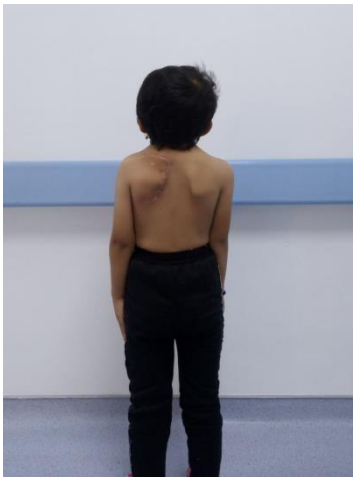
D



E



F



G

H

J

Fig.2. Patient Mukhtorzhonova G., 5 years old, East. Diseases No. 4187 (description in text).

Thus, the proposed method for correcting the concave deformity of the scapula in children is less traumatic and allows correcting the shape of the scapula. Elimination of deformities of the scapular bone in the process of bringing it down to anormal level prevents recurrence of the disease in the postoperative period and allowsobtaining good anatomical, cosmetic and functional results due to the uniform fit of the scapula to the surface of the chest.

Conclusions

1. Surgical treatment of Sprengel's disease has its own characteristics and difficulties associated with concomitant congenital anomalies of the musculoskeletal system and other organs and systems.

2. In preparation for the surgical treatment of Sprengel's disease, palliative operations should be performed such as muscle myotomy, resection of the proximal edge of the scapula.

3. Adaptation of the scapula to the surface of the chest allows the scapula to slide freely when the shoulder is abducted. After the reconstruction of the scapula, good results were observed in 85.0% of patients.

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