IMPROVING SURGICAL TREATMENT IN CHILDREN WITH CONGENITAL ATRESIA OF THE EXTERNAL AUDITORY CANAL

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ABSTRACT

Congenital malformations (syn: anomaly or dysplasia) - characterised by deviation from normal anatomical development and from regular function. It is characterised by developmental delay, abnormal embryogenesis or both due to spontaneous genetic mutations - this occurs in most congenital malformations of the outer and middle ear - approximately 10% of cases.

Introduction. Congenital malformations (syn: anomaly or dysplasia) are characterised by deviation from normal anatomical development and from regular function. It is characterised by developmental delay, abnormal embryogenesis or both due to spontaneous genetic mutations - this occurs in most congenital malformations of the development of the outer and middle ear - approximately 10% of cases. [1, 2, 3, 4].

The diagnosis of atresia of the external auditory canal is not difficult because of the associated microtia. However, the condition can occur in the absence of microtia, so a thorough otoscopic examination to identify the auditory canal is necessary. A search for other associated anomalies including renal, vertebral, and craniofacial/structural anomalies should also be considered. Syndromic conditions associated with atresia of the external auditory canal include hemifacial microsomia/Goldenhar and Treacher-Collins syndromes.

Infants are sometimes referred to the outpatient department with CT scans when they are a few months old. The timing of CT scans varies among health care providers. CT scans are performed in the first few months after birth for the following reasons: (1) it is the best method to detect the condition of the outer and middle ear; (2) it shows the presence or absence of an inner ear anomaly and can determine the cause of hearing loss; (3) it shows the presence or absence of congenital cholesteatoma middle otitis media and (4) it is used to understand the severity of temporal bone anomaly at an early age to confirm the possibility of outer ear canal reconstruction and reassure the patient's family. With recent advances in CT equipment, the radiation dose is decreasing, but radioactivity exposure from CT is still tens of times higher than from plain radiography. In addition, due to the smaller body size, organ exposure in children is 2-5 times higher than in adults under the same conditions [12]. In addition, image contrast tends to be worse in children because they have less fat and fewer organs than adults. Thus, the dose of radioactivity should be increased when a higher contrast image is required. Therefore, CT in children should be carefully planned with the above in

mind. Congenital cholesteatoma media otitis media has been reported to occur in 4-7% of patients with congenital stenosis or atresia of the external auditory canal [13, 14]. Therefore, it is better to perform a CT scan as soon as possible to rule out congenital cholesteatoma otitis media. However, diagnosis of cholesteatoma middle otitis media based on CT images is sometimes difficult because fetal remnants and exudate often persist in the middle ear cavity for 1 year of life. In addition, it may take several years before the disease is sufficiently advanced to show overt symptoms, even if the diagnosis was made in infancy. MRI is useful diagnostically to help differentiate congenital cholesteatoma from other soft-density middle ear exudates. On MRI, a cholesteatoma will appear with low signal intensity on T1-weighted images and high signal intensity on T2-weighted images.

F. Bezold and F. Siebenmann in 1908 described a surgical procedure in which the antral region was opened from the mastoid and a wide canal was made, lining the mastoid cavity with grafts [14.].

In 1992, R.A. Jahrsdoerfer [15] created a classification system for congenital ear atresia based on high-resolution CT scan of the temporal bone. Such parameters as the presence of the stapes, the state of the oval and round window and middle ear cavity, the facial nerve, the maleusinc complex, pneumatisation of the mastoid process, the anvil-stem connection and the appearance of the external ear were evaluated. One point was given for each parameter that was within the normal range, except for the presence of the stapes, for which two points were given. According to R.A. Jahrsdoerfer, the score obtained (out of a maximum of 10 available points) expresses the possibility of satisfactory postoperative results. However, his classification is mainly functional, as he gives only one point to the appearance of the outer ear. It is now evident that plastic surgeons, like ENT surgeons, have different and sometimes conflicting priorities.

In 1998, P.R. Lambert presented a retrospective study of 55 patients (59 ears) who underwent surgery for congenital ear atresia over a period of 11 years. He used an anterior surgical access under continuous facial nerve monitoring. An external canal was created and surrounding bone was removed from the auditory ossicle chain so that the latter was centred on the new external auditory canal. A fascia graft was used to create the tympanic membrane. Finally, the external canal was lined with a split skin graft overlapping the fascia graft. Revision surgery was necessary in about one-third of the patients. The main complications that occurred, according to Lambert, were facial nerve palsy (1.5% of patients) and significant hearing loss (3%).

Purpose of the study: improvement of surgical treatment in children with congenital atresia of the external auditory canal

Materials and methods of research. The work was carried out in the department of 'Plastic Surgery and Otorhinolaryngology' of NDMC and ENT department of multifilial children's central clinical hospital of Samarkand region. The study included 63 patients who had absent external auditory canal, middle ear was hypoplastic, ossicles were severely deformed, besides, inhibition of pneumatisation of mastoid cells was revealed.

Among 63 clinical cases of patients, in 57 cases congenital atresia of the external auditory canal was unilateral, in the remaining 6 cases it was bilateral (Table 1), in 57 patients the pathology was combined with microtia of I, II or III degree. The remaining 6 cases had normal auricles.

The main complaint in all patients was hearing loss in one or both ears. In 9 cases the patients indicated the presence of permanent or temporary noise in the ear.

In 8 (12.7%) cases there was a concomitant genetic disease - Goldenhar syndrome.

Tone audiometry was performed according to accepted clinical standards by audiologists in a soundproofed room. Bone conduction and air conduction thresholds were determined at frequencies of 250, 500, 1000, 2000, 4000 and 8000 Hz.

All 63 patients underwent surgery under general endotracheal anaesthesia. The patient was lying on his back, with the head turned to the side, the incision of the behind-the-ear region.

In congenital atresia of the external auditory canal, we opted for posterior access. Since the anomaly was different and the facial nerve and middle cerebral fossa were not traumatised, the antral region was defined.

To do this, we first drew the temporal line and drew an additional line perpendicular to it from the mastoid region. The area of the internal angle of the place of connection of the two lines was estimated as the projection of the antral region.

The above-mentioned area was drilled with a sharp drill. After an anthrotomy, drilling was continued anteriorly and superiorly. In this case, the semicircular canal was evaluated as the main feature. After identifying the antral region, it was enlarged by mastoidectomy. Then continued the enlargement towards aditus ad antrum to identify the short anvil outgrowth. When the short incus process was identified, the thick atretic plate was removed, which extended from the mastoid surface to the middle ear cavity, and the entire fixation of the auditory ossicles was exposed. Variants of malformations of the ossicular apparatus, synostosis of the malleus and incus with absence of the handle and lateral process of the malleus was found in the majority of 32 (50.9%) patients, 5 (7.9%) patients showed underdevelopment of the long process of the incus or its absence, 2 (3.2%) cases showed absence of the incus, and 5 (7.9%) patients showed an elongated posterior pedicle of the stapes.

The most common facial nerve anomaly is subtotal overhang of the facial nerve over the anteroposterior window and absence of the bony canal of the facial nerve (n=31/ 55.8%), in 3 (4.8%) cases the facial nerve is located typically in the tympanal segment and absence of its bony canal, in 7 (11,1%) cases a bifurcation of the tympanal segment of the facial nerve was revealed, in 1 (1,6%) patient the tympanal part of the facial nerve was divided into three parts, in 21 (33,3%) cases a total overhang of the facial nerve over the anteroposterior window was revealed.

In 32 patients (50.9%) after revision tympanotomy, the fixed ossicles were freed from the atretic altered walls of the tympanic cavity with a diamond bur, and the mobility of the malleus and incus was limited due to their strong fusion and fixation in the epitympanum. The surgical tactic for anvil malformations was to remove the hammer and anvil, followed by ossiculoplasty with a partial Teflon prosthesis (PORP). The distal part of the prosthesis was separated from the neotimpanal membrane by an autochondrial plate mounted on the head of a stirrup taken from the auricle.

If the patient showed a digiscence of the tympanic segment of the facial nerve, then an autochondrium was used for the prosthesis. In 6 patients (9.5%) with hypoplasia of the stirrup or its absence and the facial nerve in the bone canal, then a typhoon prosthesis TORP

was used, when the facial nerve was removed from the bone wall, then an autochondrium in the form of a columella or in the form of a tablet was installed on the head of the stirrup, and the head was under a fragment of autofasciation (neotimpanal membrane). In the absence of measurement, Bilan produces a stopwatch technique.

The creation of an opening in the auricle in patients depends on the abnormality of the development of the auricle. If the patient has grade I microtia, that is, all structures of the auricle are developed, but only in a hypoplastic form, then the hole was created from the outside through cavitas conche. In this case, a tongue-shaped incision is made, and the base of the flap remains on the side of the tragus .

In the case of anotia or a small rudiment in the form of a fold, the place of formation of the external opening of the auditory canal is made over a new external auditory tract formed in the temporal bone.

After the formation of a skin flap on the anterior pedicle, the cartilage from the base of the auricle and fibrous tissue were completely removed, the skin was mobilized.

The formed tongue-shaped flap, if it was long, was sewn to the holes made in the bone wall with a Vikril No. 5 thread and placed on top of the fascial flap of the temporal muscle.

If the formed skin flap was somewhat shorter and did not reach the fascial flap, then the flap was sewn to the holes created in the bone wall and soft tissues of the anterior wall with a Vikril thread.

If the tongue-shaped flap is too short and does not reach the bone, then the skin is sewn to the soft tissues of the anterior wall with the thread of Vicryl No. 5.

After that, the skin at both ends of the leaf-shaped skin flap taken from the inguinal region was cut, and the outer surface of the remaining skin flap in the center was folded inside to prepare a skin tube, similar to a “rolled carpet”.

After that, the skin was applied to the created external auditory canal and gradually, starting from the anterior wall, the skin was opened to other walls of the auditory canal.

The skin flap was positioned on top of the fascial flap in such a way that its outer surface of the proximal part was not turned towards the fascial flap.

Two latex strips are applied to the skin flap in the shape of the letter "X" to ensure that the skin flap does not shift when removing the tampon from the external auditory canal after surgery.

After that, a Miracel tampon is applied to the external auditory canal and a 0.9% sodium chloride solution mixed with antibiotics is poured into it.

After tamponade of the external auditory canal by the Myrocele, the edges of the distal part of the skin flap were bent in the middle. After that, a knotty suture with vicryl No. 4 was applied in three places in the subcutaneous layer of the wound behind the ear.

After that, the curved skin was pulled out of the hole created in the rudimentary auricle and a knotty seam was applied with a thread "Prolene No. 6".

After that, the wound behind the ear was stitched in layers with vicryl No. 4. An aseptic bandage was applied to the wound.

Results. All patients operated on with congenital defects of the external auditory canal were under the dynamic supervision of an otolaryngologist. Tampons and latex strips were removed from the external auditory canal on the 21st day after surgery. The first appointment was made in all patients 2 weeks after the date of receipt of the tampon. After that, he was re-

examined once a month for 6 months. After 6 months, follow-up was carried out every 3 months and for two years.

During the entire postoperative period, 3 patients complained of pain when opening their mouths and chewing. This indicates damage to the mandibular-temporal joint during surgery. In the postoperative period, after the appointment of planned NSAID treatment, these cases were excluded. Also, no paresis of the facial muscles on the operated side was detected in any patient in any of the operated groups.We evaluated the anatomical and functional results of surgical treatment: the immediate postoperative period is from 1 to 6 months, the long-term postoperative period is from 1 to 2 years.

To evaluate the functional results of the operation, the data of tonal threshold audiograms were analyzed. The criteria for evaluating the effectiveness were the degree of hearing loss and reduction of the bone-air interval.

In addition, intraoperative findings were analyzed in patients and compared with data from preoperative temporal bone MSCT.

The results obtained during the operation did not differ much from the CT scan data before the operation. Individual features of the structures of the middle ear, according to preoperative CT scans of the temporal bones, coincided with intraoperative findings in 97% of cases.

The location of the facial nerve did not differ significantly from the preoperative CT and intraoperative data. Before the surgical stage, CT revealed that the facial nerve was totally hanging over the vestibule window in 18 (28.6%) patients, and at the intraoperative stage it was revealed in 21 (33.3%) patients. In 34 (53.9%) patients, subtotal overhang of the facial nerve over the vestibule window and absence of the bone canal of the facial nerve before the surgical stage were revealed, and intraoperatively in 31 (49.2%) patients.

In the postoperative period, during surgical treatment of anomalies of the external auditory canal, prevention was aimed at: 1) restenosis of the external auditory canal, 2) prevention of infection of the external auditory canal, 3) prevention of granulation of the external auditory canal, 4) perforation of the neotimpanal membrane.

When evaluating anatomical results after surgical treatment of congenital defects of the external auditory canal, we evaluated mainly three outcomes: “good”, “satisfactory” and “unsatisfactory.”

We defined a "good" anatomical outcome as the absence of any of the four above-mentioned signs in the early and late periods.

In addition to restenosis of the external auditory canal, the anatomical result was considered "satisfactory" if the patients had infection or granulation of the external auditory canal and perforation in the neotimpanal membrane.

If the patient has four of the above signs, the anatomical result is assessed as "unsatisfactory".

In 42 (66.6%) patients in the early and 49 (77.8%) patients in the long-term postoperative period, a "good" anatomical result was obtained In the long-term period, "good" anatomical results are explained by the fact that the ends of the skin clot in the external auditory canal fuse well with each other, and the sutures applied to the auricle remain outside, and the diameter of the newly formed bone canal of the external auditory canal is at least 1 cm . In the long-term postoperative period, 7 patients (11.1%) also retained moisture

in the external auditory canal, which was assessed as a "satisfactory" anatomical result of hair growth on the newly transplanted skin flap and fungal damage to this area. 1 year after surgery, 7 patients (11.1%) with an "unsatisfactory" result had chronic inflammation of the skin flaps in the bone parts of the external auditory canal, an external auditory canal was formed in cases of 1 cm or less and, accordingly, the re-formation of atresia associated with skin damage was determined.

Patients with chronic (inflammatory) fungal diseases of the hair and skin of the external auditory canal were first treated by a dermatologist, then patients with recurrent atresia were operated on again.

Conclusions: Thus, in the postoperative period, the absence of repeated narrowing of the external auditory canal, which occurred in 88.9% of patients, indicates the effectiveness of the methods used. The fact that the diameter of the formed external auditory canal is at least 1 cm, that its bone wall is completely covered with a skin clot, that the lingual clot on the anterior wall is located freely, and also that the distal part of the skin clot is tightly sewn to the skin, was regarded as the reason for the absence of re-formation of atresia, resulting in a stable anatomical result.

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