



SURGICAL TREATMENT OF JOINT HORIZONTAL STRABISMUS

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| Article history: | Abstract: |
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| Received: March 11 th 2022 Accepted: April 20 th 2022 Published: May 30 th 2022 | Joint (non-paralytic) strabismus (strabismus) is a condition in which one of the eyes permanently or intermittently deviates from the general fixation point, leading to impaired binocular vision in almost all patients. Binocular vision of the external world, impaired perception of movement and direction in space. Binocular vision can be detected in patients with strabismus only in 1–3% of cases [Avetisov E.S.]. As a rule, this condition is noted in cases where the eye has a small deflection angle and its long duration. With strabismus, visual acuity often causes the eye to squint. This condition is called dysbinocular amblyopia. Therefore, strabismus is not only a cosmetic defect but can also limit the patient's professional capabilities. Strabismus in children and adults is both a psychophysical and a social problem, making it difficult to establish social connections. |

Keywords: Accommodating, partially accommodating and non-commodative, according to the origin of Strabismus, history of Strabismus surgery. An alternative to resection is flexion of the horizontal muscles. Damage to the structures attached to the muscles and perforation of the sclera

According to various authors, the incidence of strabismus in preschool children varies from 1 to 3% [1]. Age affects the heterogeneity of the prevalence of different types of strabismus [21]. Convergent strabismus (exotropia) often occurs at an early age. Divergent strabismus (exotropia) occurs in old age. According to Krasilnikov, V.L. [9], the frequency of strabismus increases from 2.5 ‰ in 3 years to 14.9 ‰ in 6 years.

Traditionally, strabismus is divided into accommodative, partially accommodating, and non-commodative, depending on the nature of its origin. Accommodative strabismus is usually treated conservatively. Pleoptics, orthoptics and diploptics are used for this purpose. The complex treatment of partially accommodating and non-accommodating strabismus includes surgical procedures. Surgical exposure with horizontal strabismus is performed in the horizontal muscles of the eyeball.

The goal of strabismus surgery is to create conditions for the development of binocular vision, increase the field of vision and achieve better vision, as well as achieve symmetry or close symmetry in the eye position, which is necessary to improve the psychological state. helps increase the patient's self-esteem.

Absolute contraindications for surgery include: inadequate optical correction, paralysis of the sixth nerve with incomplete spontaneous regeneration, and the presence of asymmetric binocular vision. A

relative contraindication in children is previously untreated amblyopia.

The history of strabismus surgery dates back to the late 18th century. The first surgical intervention for horizontal strabismus (esotropia) was a myotomy of the medial rectus muscle of the eye. In 1839, Dieffenbach of Germany performed the first official myotomy. Many authors, such as Roux in Paris, Velpeaux, and Bonnet in Lyon, then do a tenotomy instead of a myotomy. In 1883, de Wecker described muscle spasm, and Blazkovich described muscle resection. Thus, by the end of the nineteenth century, surgical treatment of esophagitis was accompanied by methods aimed at weakening the medial rectus muscles of the eye (tenotomy, myotomy) and strengthening the lateral rectus muscles of the eye (folding and resection). Ilab-supported. Advances in anesthesiology and suturing in the twentieth century led Jameson (1922) to replace tenotomy with muscle recession. Since then, strabismus surgery has not changed significantly until the 1970s, when Koppers created retroequatorial myopia. Thus, there are currently two types of surgical techniques for surgeons: classical surgery, recession, resection, and their options. Conventional direct access to muscles E.S. Avetisov [1]. The incision of the conjunctiva and the Tenon capsule is made in a vertical direction directly over the muscle. The total length of this incision is 10-12 mm, and at the end of the operation a continuous twist suture is applied. This incision is used very often



because it allows you to work on the muscle easily and comfortably by performing any manipulation. A dosing regimen for recession and resection depending on the angle of strabismus was proposed [2].

An alternative to resection is flexion of the horizontal muscles. This method reduces surgical trauma and does not lead to intentional disruption of the ciliary circulation [15].

The operation can be performed on one or both eyes. Researchers are divided on the issue. Thus, according to the observations of Lee HJ et al. [29], surgical outcomes in the bilateral recessive group were better than in the group with stagnation and antagonistic muscle twitching. Group 2 showed a higher rate of recurrence of exodeviation, while group 1 showed a more stable course. Randomized controlled studies by other authors [36] have shown that unilateral recession and medial rectus muscle resection are comparable to bilateral recession surgery in terms of postoperative outcomes for esotropia. However, unilateral recession / resection in patients with exotropia ≥ 45 PD led to more favorable long-term outcomes [22, 32].

There are also conflicting views on small-angle strabismus surgery. According to some authors, the correct solution is a two-way recession with variable exotropia [23]. However, according to other authors [8], resection (duplication) of the external rectal muscle in the hyperfunctional state is more clinically effective and selective surgery than recession of the internal rectal muscle in the hypofunctional state. is Kraus's recommendation is noteworthy, as it involves the use of the technique of pulling seams at small angles [25].

We prefer to start with muscle recession in a state of hyperfunction in horizontal strabismus surgery at any angle of deflection. The operation is performed on both eyes. In the case of a residual deviation, the second stage is resection of the muscles in a state of hypofunction of both eyes. Our experience shows that surgery in one eye can lead to a violation of the symmetry of the size of the palpebral fracture.

In recent decades, various options for the use of stiffening sutures in strabismus surgery have been proposed [8,26]. An analysis of the literature shows that there is no evidence of the advantage of adjustable sutures over non-adjustable sutures in cases of simple and predictable strabismus [18].

A group of authors [31] proposed a minimally invasive strabismus surgery (MISS) method. The term is used for strabismus surgery, which reduces tissue destruction. The muscles can be accessed not through

a single large hole, but through several keyholes located where necessary for surgical steps. If necessary, tunnels are created between the incisions, which allows for additional surgical operations. Transconjunctival suture methods are used to make the keyholes small. Incisions are always placed as far away from the limbus as possible. This (according to the authors) reduces the risk of postoperative corneal complications and ensures that all incisions are closed with eyelids, minimizing postoperative vision and patient discomfort. The benefits of minimizing anatomical tears between the muscle and surrounding tissue are better maintenance of muscle function, reduced swelling and pain, and easier reoperation. MISS holes allow all types of strabismus surgery, i.e. rectal recession, resections, folds, re-operations, retroequatorial myopectons, transpositions, oblique recessions or folds of the muscles, as well as the installation of adjustable sutures even if mobility is limited. allows. According to a number of researchers [19], the MISS method appears to be more effective in the postoperative period because the complications of swelling of the conjunctiva and eyelids were less. Long-term results did not differ between the two groups (extensive conjunctival opening and MISS method).

Strabismus surgery can be accompanied by complications such as perforation of the sclera, muscle confusion, muscle loss, severe infection, scleritis, cysts in the conjunctiva, loss of vision, postoperative nausea. The frequency of these complications is very low. The group of authors extensively analyzed the possible complications of surgeries performed for strabismus [15], the most common postoperative complication being the hypoeffect, sometimes a hypereffect. Convergent strabismus becomes divergent and vice versa [4,5,6,14]. A total of 60 complete reports of adverse events and complications were obtained during the study period. About 24,000 strabismus surgeries have been performed in the UK, which is 1 in 400 surgeries (95% binomial accuracy, 1 in 333-500 surgeries). The most common complications reported were perforation of the eyeball (19 [0.08%]), followed by suspected muscle spasm (16 [0.067%]), severe infection (14 [0.06%]), scleritis (6 [0.02%]) and there was a loss. muscle mass (5 [0.02%]). In general, complications were reported in equal amounts in adults and children; however, scleritis is significantly more common in adults. Poor or very poor clinical results were recorded as 1 in 2400.

Injury to the structures attached to the muscles and perforation of the sclera should be



prevented with careful surgical technique and effective enlargement [35]. Orbital inflammation and anterior segment ischemia usually respond to effective treatment. Muscle slippage can be prevented using effective sutures, and usually "lost" muscles can be restored. Conjunctival cysts and wound damage can be prevented with careful technique, but in some cases reoperation may be required. Postoperative flattening may be impaired due to the variability of preoperative measurements and long-term, especially exotropic, displacement. Postoperative nausea and vomiting may be due to anesthesia.

Postoperative use: Antibiotics and eye drops for lubrication are applied during the first week after surgery. In the early postoperative period, patients should be monitored for postoperative infection, conjunctival divergence.

Another type of correction of strabismus is the introduction of botulinum toxin into the muscle layer of the oculomotor muscles [24, 17]. Botulinum toxin was introduced as a drug therapy 20 years ago by Dr. Alan Scott. The first clinical use of type A botulinum toxin (BT-A) was to treat strabismus and periocular spasms. Botulinum toxin type A is often effective for small and medium-sized convergent strabismus (esotropy) for any reason, and surgery may be an alternative in such cases. . The use of BT-A for strabismus varies greatly between cities and countries for no apparent reason. Botulinum toxin type A may be helpful, especially in cases where surgery is not necessary for strabismus. This may occur in elderly patients who are unfit for general anesthesia, when the clinical condition is developing or unstable, or when surgery is unsuccessful. Botulinum toxin type A, regardless of the cause, can temporarily relieve symptoms in many cases of annoying diplopia. Ptosis and acquired vertical deviations are the most common complications. Dangerous complications for vision are rare. Reuse of BT-A is safe. However, there are reports of vitreous hemorrhage and regmatogenic retinal detachment that develop after intramuscular injection of botulinum toxin [30]. A number of authors have successfully used Botox after using traditional strabismus surgery to correct residual angles of strabismus. Based on long-term follow-up, a number of authors concluded that the use of botulinum toxin type A (BoNT-A) injections is indicated for the treatment of various types of strabismus and oculomotor paralysis. This is a short procedure that reduces the effects of general anesthesia, causes minimal scarring compared to surgery, and can be

suggested as an early treatment for unstable strabismus [20].

Optimal age views for surgery for strabismus are also controversial. In 2005, a report was published on the results of the study "Early or late surgical treatment of strabismus in children". According to this study, stereoscopic vision in children undergoing surgical treatment for convergent strabismus performed at an early stage (6 months to 2 years) was better than in older children who underwent surgery. However, the debate over the optimal timing of "early" surgery has been going on for almost 15 years.

The European Early and Late Strabismus Surgical Study [34] (ELISSS) concluded that 13.5% of children operated on at 20 months and 3.9% (P = 0.001) of children operated on at about 49 months had gross stereopsis (Titmus Housefly). . At the age of 6. The rate of reoperation in early operated children was 28.7% compared to 24%. 6% delayed. Kashenko et al [7] analyzed the results of surgical treatment of joint strabismus in adults. The authors found that surgical treatment helps to restore the symmetrical position of the eye, in many cases functional suppression leads to the elimination of scotoma and creates conditions for the formation of binocular vision and functional rehabilitation of patients. Almost the same conclusion was reached by other researchers [11]. Aznuryan I.E. and the co-authors analyzed the results of surgery performed on 57 patients with acquired strabismus using their own methods [3] under the STRABO scheme. After 12 months, all 57 children achieved correct eye position and stable binocular vision. Kurup SP et al [27] present the results of surgical treatment of partially accommodating strabismus. 84 patients were examined. At the final visit, 51 (61%) patients underwent stereopsis with Titmus StereoTest. The mean follow-up time was 4.4 ± 2.8 years (0.8 to 11.0 years). Of the 84 patients, 56 (67%) had a comfortable location.

Our many years of experience [12,13] allow us to conclude that the optimal age for strabismus surgery in children is 4–6 years of age. With the normal anatomical structure of the eye, binocular vision was restored in almost all patients over a long period of time (more than 15 years), according to our observations. One of the main reasons for the poor outcome of strabismus surgery is the presence of anisometropia. Therefore, the development of optimal methods of correcting anisometropia in children is an urgent problem of modern ophthalmology. Surgical



strabismus in adults gives good positive results in the absence of anisometropia. In older patients, postoperative diplopia disappears over time. Strabismus surgery in adults has many psychosocial benefits. This is reflected in the findings that the majority of adults surveyed with strabismus spend part of their lives getting rid of strabismus [28].

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