Surgical Correction of Tessier Number 8 Cleft

Antonio Fuente-del-Campo, M.D., F.A.C.S.

Mexico City, Mexico

The number 8 Tessier cleft can be a discrete horizontal shadow at the level of the lateral canthus of the palpebral fissure or a true coloboma with absence of the commissure between the upper and lower eyelids. A surgical technique, which has been used in eight patients, is described to correct this congenital defect. Four flaps are created and transposed as two Z-plasties. The lateral canthal ligament is fixed to the lateral orbital rim, and the orbicularis muscle is interdigitated to restore its continuity. This procedure reconstructs the depth of the conjunctival fornix, provides proper form and length to the palpebral fissure, and restores continuity and an anatomic angle to the malformed canthus.

Of all the craniofacial clefts described by Tessier, cleft number 8, particularly in its isolated form, is one of the least common. Known also as a frontozygomatic cleft, it can be expressed as a dermatocele occupying the lateral canthal recess, a horizontal shadow or a deep depression at the level of the lateral canthus, or an actual lateral coloboma of variable width that extends toward the temporal region.

The coloboma is characterized by a lateral interposition of a strip of skin between the upper and lower eyelids that disrupts the continuity of the orbicularis muscle and obliterates the depth of the conjunctival fornix in this area (Fig. 1). The absence of continuity in these structures prevents normal function of the orbicularis oculi muscle and the fixation of the lateral canthal ligament to the lateral wall of the orbit.1-3

The length of the palpebral fissure is sometimes reduced. Occasionally, there is a bony fault of the lateral wall of the orbit that can extend through the frontozygomatic suture to the greater wing of the sphenoid bone.1,4-6

The number 8 cleft can be seen in Treacher Collins syndrome, hemifacial microsomia, and Goldenhar syndrome.2,3,7,8 Just as in all the clefts, variation of range and depth occur. In Treacher Collins syndrome the main disturbance is located in the bone and muscle, while in Goldenhar syndrome the skin and soft tissues in general are more involved.9

The object of this paper is to present my experience with this rare malformation and its surgical correction. I have not included patients with Treacher Collins syndrome, since its characteristics require a different surgical approach.

SURGICAL PROCEDURE

The operation starts by defining the fault at the lateral end of the ciliary margin (points A and B) of the upper and lower eyelids (Fig. 2, above, left). Following the superior and inferior tarsal folds, lines are drawn on the upper and lower

---

From the Department of Plastic and Craniofacial Surgery at the Hospital General Dr. Manuel Gea Gonzalez and the Graduate Division of the Medical School of the Universidad Nacional Autónoma De México. Received for publication June 5, 1989; revised October 10, 1989.

658
FIG. 2. Surgical procedure. (Above, left) Marking of incisions. (Above, center) Dissection of flaps. (Above, right) Fixation of lateral canthus to orbital rim. (Below, left) Points C and D are sutured to point E. (Below, right) Direct closure of the wounds.

eyelids that parallel the ciliary margin. The lateral ends of these lines (points C and D) are connected to points A and B, respectively, by two perpendicular lines of the same length. These lines define the upper and lower limits of the cleft.

The enclosed area is divided by a horizontal line into two symmetrical, laterally based flaps. The length of this line is determined by taking into consideration the length of lines AC or BD plus the lateral displacement required to properly position the canthus and to restore normal width to the palpebral fissure.

Once the incisions are made, four flaps are developed: an upper and a lower medially based palpebral flap and two laterally based flaps (Fig. 2, above, center). The underlying fibrous tissue, which represents the frustrated formation of the canthal ligament, is gathered and pulled laterally upward and backward and sutured to the periosteum or fixed through a drill hole in the lateral orbital rim (canthopexy). The unaffected lateral canthus serves as a guide to the proper height and depth of the reconstructed canthus (Fig. 2, above, right). Conjunctiva and skin are sutured, matching lines AC and BD.

The orbicularis muscle bordering the cleft is dissected in both eyelids, and the ends are interdigitated to restore continuity to the sphincter. Point C is sutured to point D and pulled laterally to join point E (Fig. 2, below, left). The resulting defects from the displacement of the palpebral flaps are covered by the laterally based flaps (Fig. 2, below, right). The bony defect of the lateral wall of the orbits is usually shallow, and the bulk of the intertwined orbicularis oculi muscle usually fills the depression in a satisfactory manner. However, in some cases it may be necessary to fill the hollow with a split calvarial bone graft.

RESULTS

A successful palpebral reconstruction must restore form and function by creating a palpebral fissure that matches the contralateral normal one. The skin must be thin, flexible, and show a minimum of scars.

To evaluate the results, I have considered the following points:
1. Ocular protection
2. Continuity between the upper and lower ciliary borders
3. Form of the new canthus
4. Depth of the conjunctival fornix
5. Configuration of the superior tarsal and inferior tarsal folds
6. Function of the orbicularis oculi muscle
7. Symmetry in dimension, direction, and convexity when compared with the contralateral normal side
8. Proportional relationships between the new canthus and the neighboring structures
9. Orientation of the eyelash
10. Quality of the scars

Fig. 3. (Above, and center, left) Patient with a right number 8 Tessier cleft. (Center, right) Radiographic detail showing the bony component of the cleft. (Below) Postoperative views 2 years later.
Taking into consideration all these features, six of the eight patients had highly satisfactory results (Figs. 3 and 4). In one patient, a hyperpigmented scar was noted. In the remaining patient, a secondary adjustment was necessary to correct the depth of the conjunctival sac.

**DISCUSSION**

Other procedures to reconstruct lateral canthal clefts have been based on direct closure of the defect. The advantages of the technique described in this paper are related to the use of the skin that is located in the fissure. This additional skin facilitates the creation of a lateral canthus that has a more natural form and function. Tension is reduced, thus improving the quality of the scars and decreasing the possibility of relapse. The scars are practically invisible because of their location in natural skin lines.

The technique reconstructs the depth of the conjunctival fornix, gives proper form and length of the palpebral fissure, and restores ciliary continuity and an anatomic angle to the canthus. It is possible to gain up to 10 mm of palpebral length while maintaining the proper vertical opening.

This procedure is not indicated when there is a defect larger than one-third of the palpebral structures; it will result in a short palpebral fissure. The procedure has been found to be a good resource in the difficult field of palpebral reconstruction. I have also used this method to correct similar defects caused by trauma or neoplasms.

Antonio Fuente-del-Campo, M.D.
Camino a Sta. Teresa No. 1055-239
Col: Héroes de padierna
México, D. F. 10700

**REFERENCES**

Discussion

Surgical Correction of Tessier Number 8 Cleft

by Antonio Fuente-del-Campo, M.D., F.A.C.S.

Discussion by Linton A. Whitaker, M.D.

The condition and procedures described are indeed rare, and the author’s experience is unusually large. The lack of fusion of the upper and lower lids at the lateral canthus, the absence of continuity of the orbicularis oculi muscle, and the occasional notch or irregularity of bone corresponding to the lack of ectodermal-mesodermal fusion at the lateral canthus are observations of interest. It would be interesting to know how many of the eight patients had bony clefts. Since, in the patients described, soft-tissue repair alone was generally felt to be adequate, it also would be of interest to know how what is described as a number 8 Tessier cleft differs from coloboma or simply lack of fusion of the upper and lower eyelids at the lateral canthus.

While Treacher Collins syndrome patients were purposely not included, it is not clear as to whether or not some of the patients had hemifacial microsoma or Goldenhar’s syndrome. Did the patients in the series simply have the isolated cleft at the lateral canthus? How many of these patients have bony defects? Is it possible to call this a number 8 Tessier cleft without a bony defect? In fact, it would seem that this is a variation of an eyelid coloboma in those patients who did not have bony defects, a fascinating entity in itself. If so, the paper might more appropriately be titled “A Procedure for Reconstructing Lateral Canthal Clefts,” since there is minimal description of the treatment of the bony defects.

The procedure provides a solution for individuals with lack of fusion of the upper and lower eyelid margins at the lateral canthus. Questions that arise about the procedure are whether or not the single-suture fixation from points A and B to the bone or periosteum of the lateral canthus will hold the stretched-out palpebral fissure in place or will result in a tendency to rounding of the palpebral fissure point. The fusion of abnormally located fibrous tissue in conjunction with the lateral canthal ligament and perhaps some orbicularis muscle is what is actually sutured to the lateral orbital rim. This method of performing a canthopexy can be effective, but it needs adequate mobilization and fixation to remain without tending to shift back into its previous position. The patient shown in Figure 3 has narrowing of the palpebral fissure as well as some lengthening. There is no indication as to how long this is after surgery. The narrowing may relax if the postoperative result shown is soon after surgery. The only other patient shown is viewed at a 45-degree angle, with the eye in the before and after photographs in different positions. It is not possible from the photographs to tell whether or not the palpebral fissure has been lengthened in the second patient. It would be of interest to know the vertical and horizontal measurements of the palpebral fissure before and after the procedures were done as a final step in demonstrating the effectiveness of the procedure.

The author has thus described an effective method of treating lack of fusion of the upper and lower eyelid margins at the lateral canthus. The procedure is in effect a canthoplasty using laterally based skin flaps and a canthopexy bringing the point of the palpebral fissure more laterally and attaching it to periosteum or bone. In most of the patients described, no bone work was thought necessary. This alone is of interest, since

Received for publication November 27, 1989.
clefts of the eyelid margin are rare, but bony problems associated with clefts of the eyelid margin are frequent. Additional information about the bony problem, its frequency, and treatment as well as more detail about the method of interdigitation of the orbicularis muscle would have been of interest. With the large experience being accumulated by the author, I look forward to more details on these aspects of the procedures in the future.

Linton A. Whitaker, M.D.
Division of Plastic Surgery
Hospital of the University of Pennsylvania
Tenth Floor/Penn Tower
3400 Spruce Street
Philadelphia, Pa. 19104