A Modified Lateral Canthal Approach for the Treatment of Zygomatic Complex Fractures

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We present a modification of the classic lateral canthal approach by means of which the anatomy of the lateral palpebral edges will remain unscathed, with the incision beginning 2 mm lateral to the external canthus. We have used this technique in 76 patients at 3 major trauma centers in Bogota, Colombia, from January 2006 to January 2012. The approach provided excellent access to the frontozygomatic area, lateral wall of the orbit, and malar body. This method avoids important anatomic structures and offers outstanding cosmetic results, especially in adult patients.

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Zygomatic complex fractures are very frequent injuries in today's clinical practice,[1] representing about 45% of all midface fractures.[2] The main therapeutic goals for the management of these injuries should be to restore form and function, preserve facial symmetry, restore ocular function, correct or prevent enophthalmos or exophthalmos, restore pretrauma sinus function when damaged, and restore the mandibular range of motion.[1,2]

Several surgical approaches have been described to treat these fractures, and controversy exists about which will offer the best esthetic result and still provide access to the fractured bones. The present report describes a modification to the classic lateral canthal approach for the treatment of zygomatic complex fractures. With this uncomplicated technique, the anatomy of the lateral palpebral edges will remain unscathed, with the incision beginning 2 mm lateral to the external canthus. We have been using this method since 2006 at 3 major trauma centers in Bogotá, Colombia.

Surgical Technique

Under general anesthesia and after the patient has been prepared and draped, the skin expression lines lateral to the external canthus are identified (Fig 1). The surgical area is infiltrated with local anesthetic and a 5-0 Prolene suture placed at the palpebral edge to prevent it from tearing. The proposed lateral canthal incision should be made through the deepest, most visible expression line. Beginning 2 mm lateral to the external canthus, a 15-mm incision with a scalpel should be made in a lateral direction.

Subperiosteal dissection will provide access to the frontozygomatic area, lateral wall of the orbit, and malar body. Through tissue tunneling, the infraorbital rim and zygomatic arch can be reached. Once the fracture has been exposed (Fig 2), it can be anatomically reduced and stabilized with plates and screws (Fig 3). The procedure should be completed with a 2-layer suture (Fig 4) and removal of the protecting suture initially placed at the lateral canthus.

Discussion

Many approaches to the zygomatic complex have been described in maxillofacial surgery studies over the years, ranging from the most conservative to quite invasive techniques. The coronal approach, for example, can be used when zygomatic fractures

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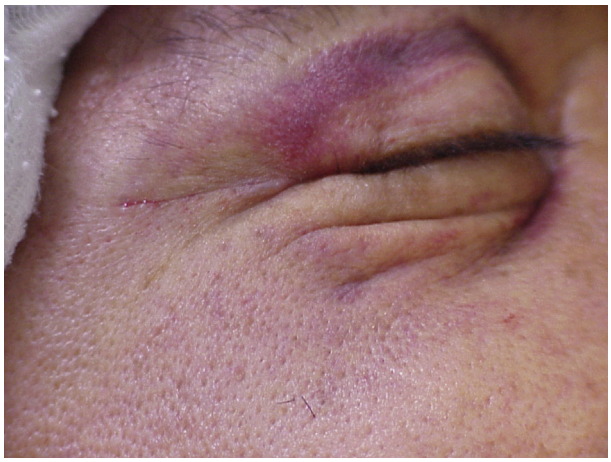

FIGURE 1. Preoperative view of the patient and identification of the expression lines.

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present in conjunction with upper third facial fractures. This approach was adapted for this purpose in 1986 by Lauritzen et al.[3] Although, it offers outstanding access, it will leave a long scar and cannot provide access to the orbital floor and infraorbital rim. The subciliary method, introduced by Pospisil and Fernando[4] in 1984, has the superior advantage of an esthetic scar. The disadvantages of this method include that it can only be used to explore the orbital floor and infraorbital rim and the risk of developing either ectropion or entropion.

Another useful approach in this context is the transconjunctival approach, initially described by Bourquett[5] and popularized by Tessier.[6] The advantages of this approach include good access to the orbital floor and rim through an invisible scar. The disadvantages include the possibility of ectropion and

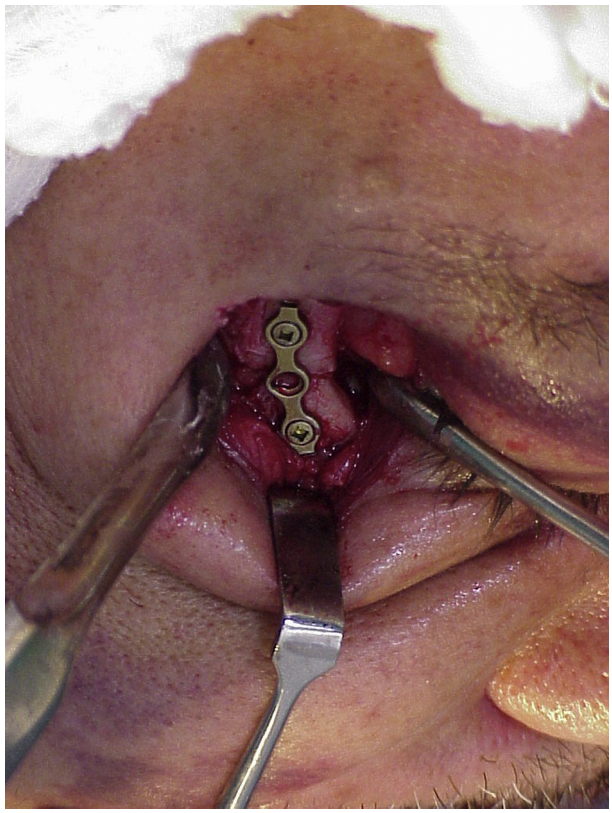

FIGURE 3. The fracture is anatomically reduced and stabilized with plates and screws.

Fernández Olarte, Abello, and Castro-Núñez. Modified Lateral Canthal Approach for Zygomatic Complex Fractures. J Oral Maxillofac Surg 2014.

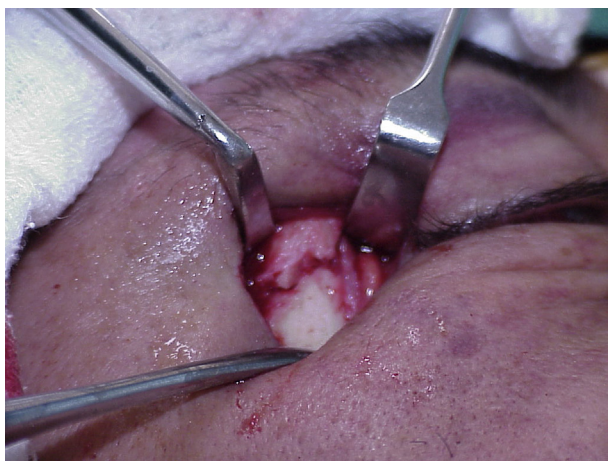

FIGURE 2. The incision is made 2 mm lateral to the external canthus, which is left intact. The incision extends 1.5 cm laterally. Subperiosteal dissection is performed until reaching the fracture.

Fernández Olarte, Abello, and Castro-Núñez. Modified Lateral Canthal Approach for Zygomatic Complex Fractures. J Oral Maxillofac Surg 2014.

FIGURE 4. Closure. A wire in the medial aspect of the wound can be identified. It corresponds to a suspension wire, we used to place back in 2006. We have since abandoned this practice.

Fernández Olarte, Abello, and Castro-Núñez. Modified Lateral Canthal Approach for Zygomatic Complex Fractures. J Oral Maxillofac Surg 2014.

FIGURE 5. Cosmetic results after a 2-week follow-up period.

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entropion of the lower eyelid and limited surgical access.

Under certain circumstances, the transconjunctival method is combined with a lateral canthotomy, a modification introduced by McCord and Moses.[7] The transconjunctival approach is extended laterally through an incision over the lateral canthus, thus separating the superior and inferior palpebral edges. In contrast to the McCord and Moses method,[7] in which the palpebral edges are surgically severed, in the technique we have advocated, the anatomy of the palpebral edges remain unscathed, because the incision begins 2 mm lateral to the external canthus.

Over the years we have implemented other approaches[8] and have found this modified lateral canthal approach to be a reliable method for the treatment of zygomatic complex fractures. This modification provides excellent access to the frontozygomatic area, lateral wall of the orbit, and malar body. Through tissue tunneling and no direct visualization, the infraorbital rim and zygomatic arch can be reached. Thus, using this approach, important anatomic structures can be avoided, with outstanding cosmetic results.

To date, we have successfully performed the modified lateral canthal approach in 76 patients, with excellent cosmetic and functional outcomes. Our statistical analysis showed a low surgical risk, high esthetic level (Fig 5), shorter surgical time, low surgical sequelae, and a general cost reduction. This approach will be more suitable for adult patients who have already developed deep lateral canthal crow's feet. However, we also believe it can be useful in selected young patients when other approaches cannot be used. Long-term cosmetic results, however, should be studied further before this method can be routinely used in the younger population.

References

1. Zachariades N, Mezitis M, Anagnostopoulos D: Changing trends in the treatment of zygomaticomaxillary complex fractures: A 12-year evaluation of methods used. J Oral Maxillofac Surg 56: 1152, 1998
2. Manson PN, Crawley WA, Yaremchuk MJ, et al: Midfacial fractures: Advantages of immediate extended open reduction and bone grafting. Plast Reconstr Surg 76:1, 1985
3. Lauritzen C, Lilja J, Valeforo B: The craniofacial approach to trauma. Ann Plast Surg 17:503, 1986
4. Pospisil OA, Fernando TD: Review of the lower blepharoplasty incision as a surgical approach to zygomatico-orbital fractures. Br J Oral Maxillofacial Surg 22:261, 1984
5. Bourquett J: Notre traitement chirurgical de poches sous les yeux sans cicatrice. Arch Prov Chir Fr Belg Chir 31:133, 1928
6. Tessier P: The conjunctival approach to the orbital floor and maxilla in congenital malformation and trauma. J Maxillofac Surg 1:3, 1973
7. McCord C, Moses J: Exposure of the inferior orbit with fornix incision and lateral canthotomy. Ophthalmic Surg 10:53, 1979
8. Fernandez H, De León O: Abordaje transconjuntival sin sutura para el manejo del trauma de piso de órbita. Odontol Maxillofac 5:34, 2001