

Use of Fibrin Sealant in Pediatric Orbital Fracture Repair

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When operative intervention for pediatric orbital fractures is required, fracture reduction and the method of fixation must accommodate the normal growth patterns of the facial bones. In smaller defects, such as periocular bones, implantable fixation hardware can further damage the delicate orbital skeleton.¹ To mitigate complications in these cases, fibrin sealant can reinforce smaller fracture segments, especially if their fixation is inherently unstable, such as in our patient's fragment fixation with a single suture attaching the bony fragment to the plate. The addition of fibrin sealant caused temporary stabilization of the fragment to achieve adequate reduction.

Fibrin sealant is a physiological derivative of human or bovine blood that is formulated into a powder or semisolid gel. Common formulations contain terminal components of the coagulation cascade—allowing immune system evasion while augmenting the clotting process and honing key growth factors essential for tissue repair.² Aprotinin or antifibrinolytic components enhance mechanical stability, allowing the fibrin clot to be maintained for approximately 3 weeks.³ Tisseel (Baxter, Deerfield, Ill.) is a fibrin sealant derived from human plasma and contains a mixture of fibrinogen, thrombin, and calcium.

We took advantage of these unique properties of Tisseel in a 14-year-old girl who presented with operative facial fractures after being kicked in the face by a horse. The rim fragments were held in anatomic position and secured using a 0.4-mm Synthes (West Chester, Pa.) titanium plate and 4-mm screws. Once secured, a 10×6mm rhomboid segment of the anterior rim was noted to be free-floating and too small for screw fixation (Fig. 1). The fragment was manually repositioned and secured with a single PDS stitch and reinforced with Tisseel (Fig. 2). There were no immediate postoperative complications. At the 1-week postoperative visit, the patient reported improved vision, less swelling, and marked resolution of the palpable infraorbital step-off. At her 6-month



Fig. 1. Left orbital rim repair secured using titanium plate unit with 10×6mm rhomboid shaped bony defect.



Fig. 2. A single polydioxanone stitch was used to manually reposition the rhomboid segment. The segment was then further secured with Tisseel fibrin sealant.

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postoperative visit, the patient continued to show clinical improvement, with normal intercanthal distance, no contour or bony asymmetries, extraocular movements intact without pain or diplopia, and no skin irritation from use of the fibrin sealant.

Our case demonstrates effective use of fibrin sealant in securing free-floating bone fragments in pediatric

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orbital rim fractures. Its use in complex orbital fractures otherwise not amenable to screw fixation suggests that this technique has utility in augmenting correction of bony defects.

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DISCLOSURE

The authors have no financial interest to declare in relation to the content of this article.

PATIENT CONSENT

Written informed consent was obtained from the patient and parent for publication of this article and accompanying images.

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