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CASE REPORT

Urgent rescue of 'missing rectus' in blowout fracture

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Summary Because guidelines for the treatment of blowout fractures have not been defined for urgent-care surgery, some patients retain a sight-threatening strabismus after surgery. The authors present a case involving the immediate operation of a blowout fracture based on CT findings and symptoms, demonstrating that early intervention may restore the full range of motion in the affected eye. The CT image showing the absence of the inferior rectus muscle on the orbital floor and no apparent fracture indicates the muscle strangulation. Immediate surgery must be performed to prevent irreversible muscular degeneration in such cases, rather than delaying the procedure by several days.

There is no complete consensus on the use of surgical intervention in blowout fractures, although debate about the need for surgical correction or a temporal complication after injury has continued for more than half a Century.[1–3] The controversy may persist because many surgical practitioners, such as otolaryngologists, ophthalmologists, plastic and maxillofacial surgeons, have managed to correct orbital fractures. In fact, gaze restriction in some patients improves within several days under conservative management.[4] However, diplopia occasionally persists even after conservative therapy, and these patients later require surgical repair of the orbital floor as well as for the enophthalmus.[5] Furthermore, because of the degeneration of the extraocular muscle during conservative and/or delayed surgical approaches, some patients may ultimately have to undergo a strabismus operation because of gaze restriction.[6]

In this report, we present the case of a blowout fracture that required an immediate operation based on the symptoms and CT imaging, which showed the absence of the inferior rectus muscle on the orbital floor and no apparent fracture indicating the muscle strangulation. In addition, we discuss the indication and timing of surgical intervention.

Case report

An 8-year-old boy sustained facial injuries after falling from a horizontal bar, and presented with diplopia, along with

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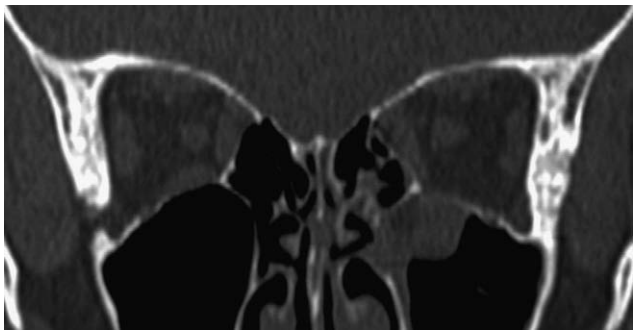

Figure 1 CT image showing the 'missing rectus'. The inferior rectus muscle was absent on the orbital floor, and there was no apparent fracture. Note the well-imaged right inferior rectus muscle belly, compared with the left side. The orbital content, including the rectus muscle, herniated into the maxillary sinus through the invisible linear fracture.

severe nausea and vomiting. He initially visited a neurosurgeon and was referred to our department for a suspected blowout fracture. Although the CT image did not reveal an apparent fracture, it disclosed the absence of the inferior rectus muscle on the orbital floor (true 'missing rectus', Figure 1), possibly caused by herniation into the maxillary sinus. The patient's left eye movements — the upgaze and downgaze — were severely restricted (Figure 2). No sensory loss was observed in the infraorbital nerve region. The diagnosis was a blowout fracture with a linear fracture of the orbital floor, and surgery was performed immediately to release the strangulated muscle. Through an extended subciliary incision, the orbital periosteum was retracted to approach the orbital floor. As expected, a linear fracture with entrapment of the orbital content was confirmed. The herniated tissue was carefully restored after the floor was punched out with a fine osteotome, and then covered by grafting bone from the outer table of the calvarium. Two months after the operation, the diplopia was completely diminished in all directions (Figures 3, 4), and the patient was even able to play soccer.

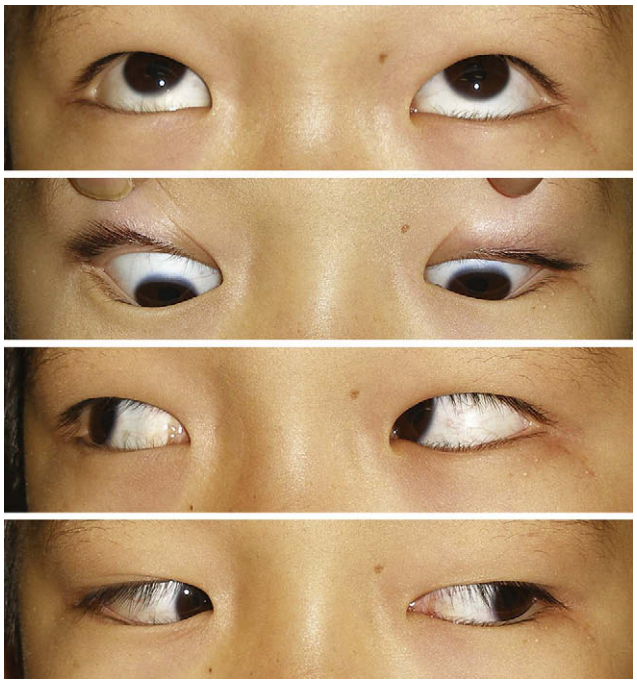

Figure 3 Range of eye motion 2 months after the operation. Eye movement was completely recovered, and the operative scar (the extended subciliary incision) was inconspicuous.

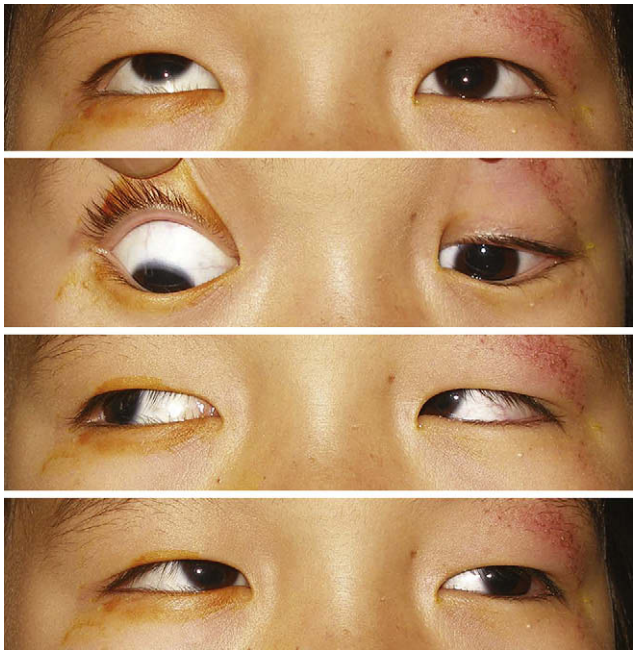

Figure 2 Range of eye motion before the operation. Downgaze and upgaze were greatly limited. Mydriasis arose because of medication administered for fundoscopy.

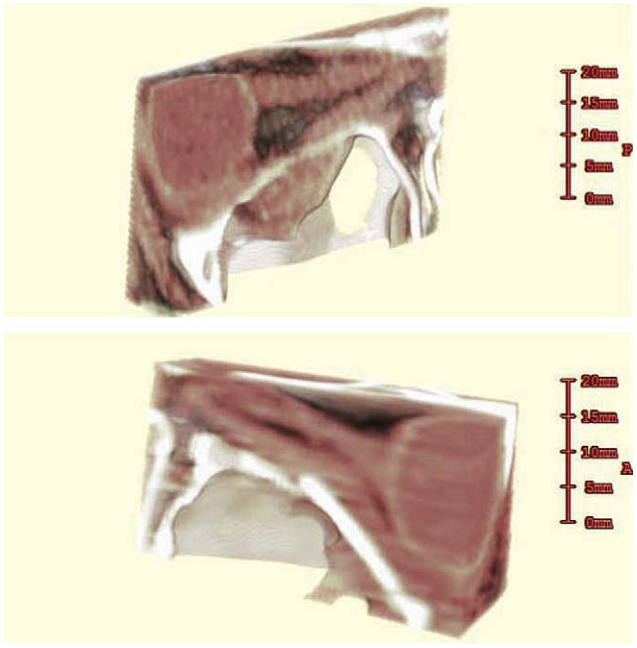

Figure 4 Three-dimensional images reconstructed from the raw CT data for this patient. Preoperation (above) and postoperation (below).