

A Case of Successful Conservative Management of Multiple Facial Bone Fractures in an Infant

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Abstract

Displaced facial fractures in infants are rare, with only limited published data, and management of such fractures remains controversial. Various authors have advocated managing severely displaced fractures by open reduction and rigid fixation. We describe our experience in successfully managing a case of multiple fractures of facial bones in an infant by conservative observation.

A 17-month-old boy sustained multiple facial fractures in a car accident. A CT scan revealed a severely displaced left zygomatic fracture and an undisplaced mandibular angle fracture. There was no orbital floor defect with entrapment of orbital soft tissue. The patient was managed by conservative observation and the outcome was satisfactory. There was complete remodeling of the severely displaced zygomatic fracture. To our knowledge, there are few or no reports on the management of severe facial fractures in infants by conservative observation. The present case suggests the wisdom of deciding the treatment method for facial fractures in infants only after careful observation and consideration.

Keyword: Pediatric maxillofacial injuries; Facial fractures; Fracture of facial bone; Facial skeleton

Introduction

Fractures of the facial skeleton are rare in children compared to in adults [1-8]. Pediatric maxillofacial injuries were reported to comprise less than 15% of all facial fractures [1-3]. In Imahara's survey of the National Trauma Data Bank (2001 to 2005) in the United States, 277,008 pediatric trauma patients (age 0 to 18 years) included 12,739 (4.6%) who had sustained facial fractures [8]. The incidence of facial fractures increased with age, and the lowest incidence was in infants (age 0 to 1 year, n=722/12,739, 5.7%) [8]. In addition, fractures in children tend to be minimally displaced, especially in infants, because of the elasticity of the bones, flexibility of the suture lines and lack of sinus pneumatization [2,3,8]. Hence, displaced facial fractures in infants are rare, and few have been reported in the literature. Here, we describe a case of multiple fractures of facial bones in an infant, which we successfully managed by conservative observation.

Case report

A 17-month-old male child without medical history was involved in a motor vehicle collision when his father drove his car into the back of a crane truck. The baby was sitting in the rear of the car, without any child seat.

He was taken to a municipal hospital, and a computed tomography (CT) scan showed fractures of the left zygoma and mandible (Figure 1). He was referred to our hospital the next day. He had severe swelling on the injured side of his face (Figure 2), but he was conscious and his vital signs were normal. Physical examinations, such as tests of eye movement, mouth opening, occlusion and sensation in the infraorbital nerve area, could not be conducted because of difficulty in cooperation. A new CT scan was performed under sedation because the data from the previous hospital were insufficient for planning treatment.

Our CT scan revealed a tripod fracture of the left zygoma, classified in Knight & North's classification as group V [9], and a fracture of the left mandibular angle. Although the zygomatic bone was severely displaced, there was no orbital blow-out fracture and the mandibular

angle was undisplaced (Figure 3). Thus, we waited for 1 week to decide the treatment method.

A fresh CT scan taken after 1 week revealed that the zygomatic deviation had improved, with a shift of the zygoma in the medial direction (Figure 4). Although the malar region could not be evaluated for possible diplopia and hypesthesia, the swelling subsided and the limitation of opening the mouth was not remarkable (Figure 5). Therefore, we decided to manage this case by conservative observation with radiological follow-up. No diet limitation was necessary because he was suckling.

Two months later, a CT scan showed further improvement of the zygomatic deviation and completion of bone union at the mandibular fracture (Figure 6). One year after the trauma, a CT scan revealed that the zygomatic deviation was completely corrected (Figure 7). His parents did not complain of anything, including his facial contour, mouth opening, eye movement, occlusion and ability to eat baby food (Figure 8).

Discussion

The management of facial fractures in children remains controversial [10-18]. The published literature provides little in regard to standard treatment protocols for pediatric facial fractures, but

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there has been some advocacy of open reduction and rigid fixation for management of severely displaced fractures [10,11,15]. However, some animal studies demonstrated adverse effects of rigid fixation on cranial facial growth [19,20]. Undermining of the periosteum may contribute to disturbance of skeletal growth. Even if resorbable plates and screws are used, there is the risk that screws will traumatize tooth buds or erupting teeth. On the other hand, it is generally accepted that stable, undisplaced and asymptomatic fractures are indications for conservative, non-surgical treatment [3,13,18].

For the present case, we were irresolute at the beginning, because the zygomatic bone was severely displaced. However, a CT scan confirmed the absence of any orbital floor defect with entrapment of orbital contents and the fact that the mandibular fracture was undisplaced. This knowledge convinced us to “watch and wait,” with the expectation that functional deficits such as diplopia and malocclusion could be avoided. The mandibular fracture in this child was at the mandibular angle, which is the second most common site of fracture in children younger than 5 years of age [8,21]. Complications such as malocclusion and malunion following conservative therapy in children are very rare [21]. Therefore, our greatest concern was the outcome of the severely displaced zygomatic fracture.

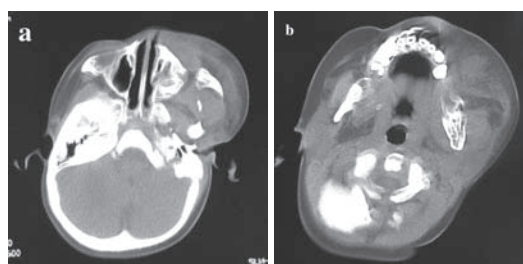


Figure 1: A CT scan taken at the previous hospital. a: horizontal view of the zygoma, b: horizontal view of the mandible.



Figure 2: The patient had severe swelling of his injured face.

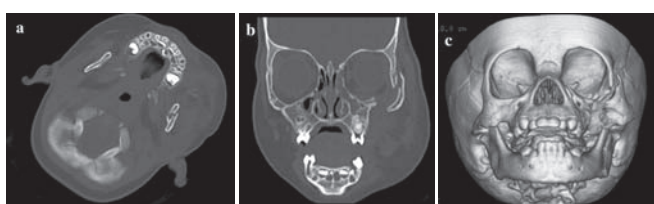


Figure 3: Initial CT scan taken at our hospital. a: horizontal view of the mandible, b: coronal view of the zygoma and the orbital complex, c: 3D CT of the facial bones.

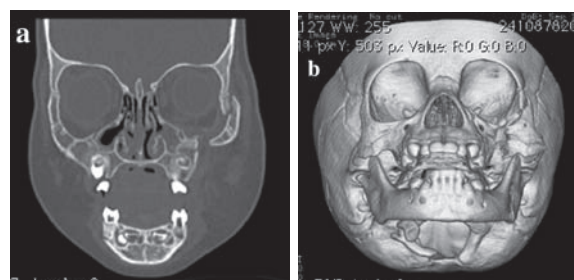


Figure 4: A CT scan taken 7 days after the trauma. a: coronal view of the zygoma and the orbital complex, b: 3D CT of the facial bones.



Figure 5: The facial swelling had subsided.

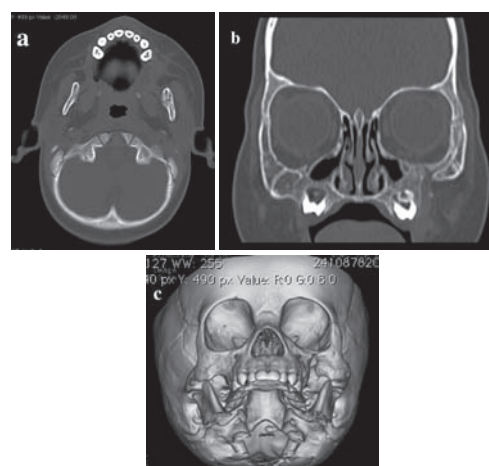


Figure 6: A CT scan taken 2 months after the trauma. a: coronal view of the zygoma and the orbital complex, b: 3D CT of the facial bones.

The potential for remodeling of the mandibular condyle [22] and nasal fractures [23] of the growing facial skeleton are well known, but few data have been published regarding remodeling of other facial regions, including the zygomatic bone. Thus, the complete remodeling of the severely displaced zygomatic fracture that we have documented here for our case represents important information for clinicians dealing with pediatric facial fractures. To our knowledge, there have been few reports of management of severe facial fractures in infants by conservative observation. We hope to perform long-term follow-up of our patient in the future.

In summary, a 17-month-old patient sustained multiple facial fractures in a car accident. A CT scan revealed a severely displaced

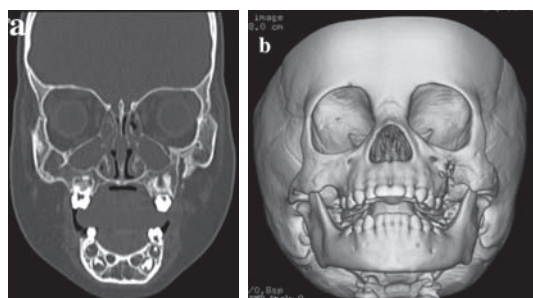


Figure 7: A CT scan taken 1 year after the trauma. a: coronal view of the zygoma and the orbital complex, b: 3D CT of the facial bones.



Figure 8: A satisfactory outcome was obtained.

left zygomatic fracture and an undisplaced mandibular angle fracture. The absence of any orbital floor defect with entrapment of orbital soft tissue was confirmed in the coronal view of the CT scan. The patient was managed conservatively, and the outcome was highly satisfactory. Our experience with the present case supports the concept that the treatment approach for facial fractures in infants should be decided after careful consideration and observation.

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