NASOETHMOID-ORBITAL FRACTURE : REPORT OF A CASE

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비골을 포함한 안와 근심벽의 골절의 처치 : 증례보고

유준영 · 김용관 · 장현석

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중안면부의 골절은 심미적으로나 기능적으로 많은 문제를 야기할 뿐아니라 두개부와 연관되어 뇌손상의 가능성을 가지므로 생명과 직접적인 연관을 갖는다고 할수 있다.

산업사회의 고도의 발달로 인하여 자동차의 보급이 증가하고 그에 따라 교통사고의 절대수가 증가하고 안면부 골절환자가 증가추세에 있다고 볼수있다. 때문에 구강악안면외과의사로서 중안면부의 골절에 관심을 기울여야 할 것으로 생각된다.

중안면부 골절 가운데 비골을 포함한 안와 근심벽의 쉽게 일어나며 골절에 포함된 해부학적 구조물들이 복잡하기 때문에 골절후에 기능적 이상이 쉽게 발생될 수 있다. 본 과에서 처치한 중안면 골절 환자중 비골을 포함한 안와 근심벽의 골절환자를 경험한 바 이에 보고하는 바이다.

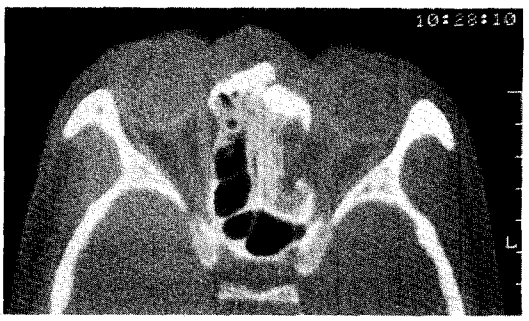
I. INTRODUCTION

Midface fracture results in many esthetic and functional problems. Most causes of midface fracture include motor vehicle accident and altercation, other causes of injuries include falls, sports-related accident, intended injuries. In recent years midface fractures have increased because of the increase automobile accident. Midface fracture may be isolated or combined and soft tissue injuries to the facial structures are commonly encounted in the treatment of midface fracture patient. Soft tissue wounds may be limited to the superficial structures, but more serious injuries may extend to involve anatomic structures such as the sensory and motor nerves of the face : the parotid, or nasolacrimal glands or duct : or the dentoalveolar structures. Especially, these fractures are combined with the orbit, brain injuries and skull base fractures. The authors experienced a case of nasoethmoid-orbit fracture, so present this case with review of literature.

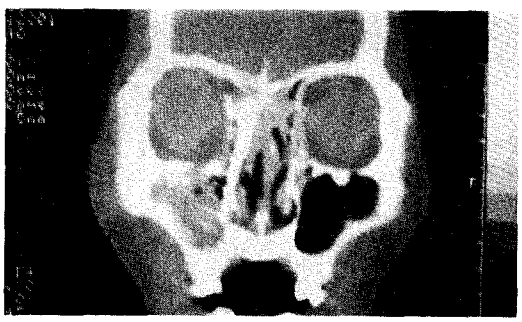
II. CASE

A 35-year-old man was come to our Depart-

ment of Oral & maxillofacial Surgery for his mid face fracture with loss of conciousness via emergency room. After his mental status was alert, he said that he was injured his mid-face by traffic accident. He complanied pain, bleeding of injuured mesial superior orbital rim area and diplopia. Clinical examination revealed mesial orbital wall fracture with nasal bone and frontal sinus fracture. We had taken CT on injured area. The CT scan shows herniation of mesial rectus muscle of eyeball and infraorbital fracture which is due to the diplopia.(Fig 1) A spectacle incision was made for exposure of frontoethmoidal (mesial side of orbit) area and subciliary incision was also made for exposure of infraorbital fracture site. Meticulous elevation of mesial wall and inferior wall of orbit avoiding damage of mesial canthal ligament and lacrimal duct. Two silastic sheets were inserted on each side of mesial wall and inferior wall of orbit for correction of preoperative diplopia. Microplate(3D microplate) osteosynthesis was done on fracture site after reduction and wound closure and



(A)



(B)

Fig 1. The CT scan shows herniation of mesial rectus muscle of eyeball and infraorbital fracture in axial view(A), and ethmoid sinus, mesial orbital wall, infraorbital wall and mesial nasal wall fracture in coronal view(B).

Fig. 2. A spectacle incision was made for exposure of frontoethmoidal (mesial side of orbit) area The picture shows microplate osteosynthesis on fracture site after reduction.

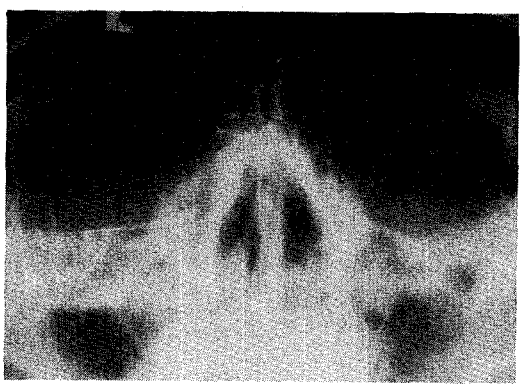


Fig. 3. postoperatively, the plain radiograph shows good result.

dressing were done after wound irrigation. (Fig 2) Postoperatively, the results are good in esthetics and function.(Fig 3)

III. DISCUSSION

Midface fracture results in many esthetic and functional problems. Most causes of midface fracture include motor vehicle accident and altercation, other causes of injuries include falls, sports-related accident, intended injuries. In recent years midface fractures have increased because of the increase automobile accident. Midface fracture may be isolated or combined. and soft tissue injuries to the facial structures are commonly encounted in the treatment of midface fracture patient. The usual etiology of nasoethmoid-orbital fracture is a taumatic insult to the radix area of the nose. Swearingen, who studied the forces necessary to produce a fracture in various parts of the facial skeleton, found the nasal region the weakest, requiring only 35 to 80 gm per square inch to produce a fracture. In contrast, the frontal bone requires 120 to 180 gm per square inch.[1] It is difficult to discuss nasoethmoid-orbital fractures as an isolated event, becasuse they are frequently associated with multiple midfacial fractures.[2] Facial injuries often associated with nasoethmoid-orbital fractures include fractures of the middle third of the face, frontal bone, or the cribriform plate; cerebrospinal fluid rhinorrhea; and direct injury to the central nervous system.

The bony deformity that produces the traumatic telecanthus can be devided into three types.[3] All three cause displacement of bony structures posteriorly and injure the medial canthal tendon as well as lacrimal sac.[3] In the first type, the nasal bones and frontal process of the maxilla are pushed laterally so that they fill the interorbital space. The bones are pushed backward along the outer surface of the medial orbital wall sever the medial canthal tendon, the lacrimal sac, or the canaliculi. Radiographs show an increase in thickness of the medial orbital wall secondary to the overlapping bone fragments. Aggressive debridement of bone in this area may creat a permanent defect. In the second type, the bony fragments enter the orbital space itself, resulting in comminution of the laminae papiraceae and outfracturing with displacement of the medial wall of the orbit. The medial canthal tendon attachment is therefore displaced with the bone and the medial canthus as well as the bony fragments are displaced laterally. In the third type of fracture, clinically the most common, the displacement of the medial canthal tendons laterally is secondary to fragmentation and comminution of the bones on which the tendon is attached. The unopposed contraction of the orbicularis oculi muscle pulls the structure laterally. In this type, the reattachment of the medial canthus to its normal structures cannot be accomplished because they have also been comminuted.[4] A system of describing nasoorbital ethmoidal trauma, as well as other associated facial fractures, has been suggested by Gruss[5], offering a more comprehensive classification of the deformity. The advantage is to aid the surgeon in diagnosis of the injury as well as in the formulation of a complete treatment plan. Three main factors determine the management of nasoethmoidorbital fractures : 1) the type of fracture-isolated extended, 2) associated bone and soft tissue injury, and 3) bone loss or presence of non functional bone. Evaluation of these three factors is needed to prepare a surgical plan. Knowlege of the type of fracture helps establish the method of surgical approach. The approach will also be influenced by the need to expose other injury site, as

in the presence of associated Le-Fort type fractures. Significant bone loss, or more commonly the presence of severely comminuted bone fragments, will require primary bone grafting to restore structural integrity and prevent soft tissue contracture.[6,7] Gruss' classification of nasoethmoid-orbital fracture[5] used these criteria and is helpful in understanding their management.

The mesial orbital wall is jointly formed by the frontal and ethmoid bones which meet at the frotoethmoidal suture. The anterior and posterior ethmoid foramina pass through this suture. A small skeletal contribution comes from the lacrimal bone anteriorly. The mesial orbital wall is also known as the lamina papyraces, reflecting its paper-thin consistency. The lacrimal fossa is a concavity within the lacrimal bone at the anteriormesial aspects of the orbit. Its boundaries are distinctly formed by the anterior lacrimal crest(a termination of the inferior orbital rim) and by the posterior lacrimal crest(the final mesial and inferior extent of the superior orbital rim). It houses the lacrimal sac. Mesial to the orbit is the ethmoid labyrinth.[8] The mesial orbital wall is the most frequently fractured structure of the orbital complex. The intraorbital soft tissue(with mesial rectus muscle) may herniated mesially by the same mechanism that causes orbital floor fractures and is often missed. Intraorbital space is deliniated by the ethmoid labyrinth with middle turbinates laterally. The roof is formed by the cribriform plate and superior turbinates. The junction of the cribriform plate and the roof of the ethmoid is the weakest portion of the roof of the interorbital space. The dura is intimately adherent to the thin bones in that location. Fractures of this area result in frequent loss of sense of smell and CSF (cerebrospinal fluid) leak.[9]

Access to the frontal sinus, nasal bone and mesial orbital wall is achieved by a bow-shape or spectacle incision.[10] Lacerations already present are taken into account during this approach. The rest of the procedure depends on the type of injury. If possible the anterior wall of the frontal sinus is reconstructed, maintaining the periosteal attachments of bony fragments where possible and fixing loose fragments with wire ligatures. In every case it is necessary to have a view of the entire frontal sinus, so that the whole extent of the posterior wall can be examined for a fracture. If the anterior wall cannot be saved in severely comminuted fractures and deep injuries, the floor and anterior wall of the sinus are completly removed after all the mucous membrane is removed from any niches and recesses.[10,11]

When the dura is torn the wound is fully exposed, cleaned, and sutured or treated by means of a plastic closure. The latter procedure depends on whether the frontal sinuses are to be obliterated or retained as a pneumatized paranasal sinus. Since obliteration requires the total elimination requires the total elimination of mucous membrane and since total obliteration cannot be guaranted by any method, it involves more risks than advantages. In every case, the drainage of secretions must be insured. This is achieved by a mucosal plasty and use of a wide drain to nose with exenteration of the ethmoid air cells. A finger stall filled with gauze serves as both tampon and drain. A wide-bore drain commonly suffices as a space maintainer.[10,11,12]

In summary, recently midface fractures have increased because of the increase automobile accident new beig seen with greater frequency. For this reason the Oral & Maxillofacial Surgeon should give more attention to mid face fracture. The authors experienced a case of nasoethmoid-orbit fracture, so pre-

sent this case with review of literature.

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