

DEPRESSED SKULL FRACTURE IN NEWBORN: A CASE REPORT

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ABSTRACT

Depressed skull fracture in newborn is rare. Occurs due to the soft resilient and easily deformable nature of the bone. Causes could be due to various perinatal factors, including pressure on skull by fetal limb, external pressure by mothers sacral promontory or pubic symphysis or related to obstetric manoeuvres. Radiological investigation is necessary to rule out underlying brain injury, and timely decision for the treatment options depends on associated injuries and depth of the depressed fracture. We present a case of a newborn with depressed skull fracture, delivered by C section after a prolonged and obstructed labour. CT scan confirmed the depressed fracture with no underlying brain injury.

Keywords: Depressed skull fracture, newborn, perinatal trauma.

Introduction

Depressed skull fracture in neonates, also known as ping-pong fracture are rare with reported incidence of 1 in 10,000 deliveries in western world.¹ Although it can be seen with no identifying aetiology, the most common cause is complications during delivery which can be due to bad obstetric manoeuvre, instrumentation or external pressure on the non ossified skull. Chronic pressure on the fetal head during antenatal period from fetal limb or fist or due to associated uterine or pelvic masses are usually referred to as faulty fetal packing. Patient presents with a visible skull depression, usually with no other neurological symptoms. CT is gold standard to look for extent of the fracture and any associated abnormalities, such as cerebral hematomas. Spontaneous elevation of the depression has been reported,⁶ but many cases have also been treated by non surgical as well as surgical intervention according to the severity of fracture. Not just for cosmetic purpose but also to prevent any neurological complication due to the pressure effect of the depression.³

Case Presentation

A 2 days old male neonate born to a 39 yearold female Para 4 by emergency C-section. All previous births were through spontaneous vaginal delivery at home in a far flung area of Balochistan and were male offsprings. She had non progressive labour this time for which she was brought to Gynae and Obs department of Bolan medical complex hospital, Quetta, where she was declared an obstructed labour and emergency C section was planned. No history of forceps application. Baby had been referred to radiology department for CT Brain, as the baby had obvious skull depression along the left side of the skull. Child appeared otherwise normal with normal Apgar score and feeding. No history of antenatal trauma reported. Plain CT brain with 3D reconstruction was performed which showed a depression along the left parietal bone (Fig.1) and minimal diastasis of the left fronto-parietal suture. Small fracture line was also appreciated along the parietal parasagittal location. Underlying brain appeared normal (Fig.2). No epidural or subdural hematoma

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was seen. Patient was referred to paediatrician, where the child was kept on conservative treatment with view that fetal neuronal tissue growth would not be affected by the fracture and growing tissue might itself push the depressed calvarial bone.

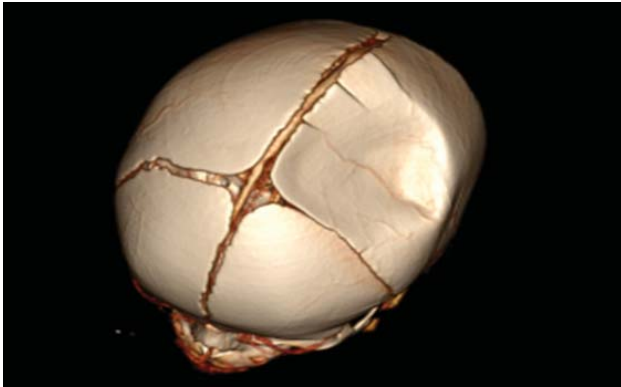


Figure 1: 3D CT image showing the depressed skull fracture

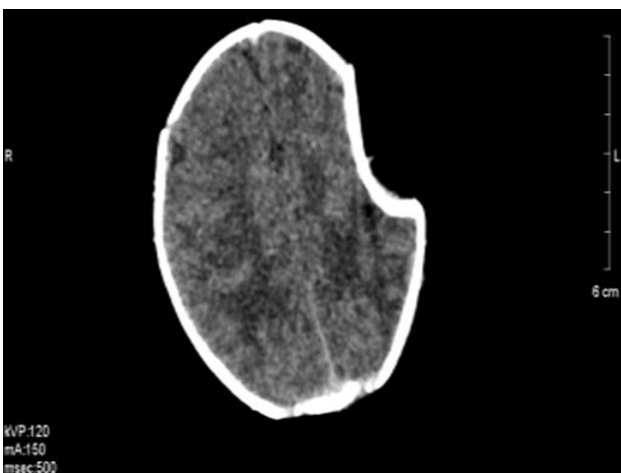


Figure 2: CT Brain: bone and brain windows showing the depressed skull fracture without underlying brain damage.

Discussion

Depressed skull fracture (DSF) of the newborn is a rare condition, accounting for 1 in 10,000 deliveries in western world.¹ It is encountered in neonates and infants due to the soft resilient nature of the skull, inward buckling of the calvaria is seen with intact periosteum and dura. It is a form of green stick fracture where no associated cortical break seen due to the soft and flexible nature of the bone which is able to indent with no break in continuity. However in our case we also noted a cortical break along with calvarial bone depression.

Recognized causes may be congenital or acquired. Congenital causes are due to antenatal pressure on the skull bone. This could be due to continuous pressure from fetal own extremities, twin, external pressure from uterine fibroid/mass, adjacent bony prominence or exostosis. This is referred to as congenital vault depression or faulty fetal packing. There is usually no associated soft tissue injuries or hematomas, as in our case. Acquired causes are acute injuries due to bad obstetric manoeuvre or instrument likes forceps delivery or post natal blunt trauma These are called ping pong fractures, as they resembles a ping pong ball. There could be associated soft tissue oedema or swelling, which resolves spontaneously. Sometimes there is no identifiable aetiology to the fracture.⁷ In our case we assumed the cause was non progressive labour and abnormal fetal position which in some way affected fetal skull bone.

These fractures commonly involve the parietal bone. Some authors document that involvement of the parietal bone is more common in western countries while frontal depression is more common in Africa.⁷ In our case left parietal bone was involved.

Radiologically plain X-ray can detect the inward indentation of the skull. Ultrasound can also be helpful in detecting any associated cerebral hematoma. CT is the gold standard which can confirm the depth of the fracture and any associated injury or lesion. MRI can be used in limited cases for any doubtful cranial injury.

Spontaneous elevation of DSF are well documented in neonates⁶ while considered rare in infants.⁴ Many cases of spontaneous elevation of these fractures were documented within few months for which watchful

waiting is considered a good option in mild cases. Spontaneous elevation occurs due to plasticity of the fetal skull, frequent crying which raises intracranial pressure, or due to growing brain. Our patient was also kept on conservative management and follow up was recommended to see gradual elevation of depressed bone fragment.

However other options include non surgical and surgical interventions depending upon the severity of the condition. As besides the aesthetic deformity these cases can be severe enough to cause brain damage, reduced cerebral blood flow or epileptogenic focus. In such cases operative or non-operative intervention are recommended. Non surgical procedures include elevation by obstetric vacuum extraction, use of breast pump or raynor- parsa manoeuvre which is done by applying digital pressure on margins of the fracture.⁷ Young jin kim³ has reported a case where elevation of depressed skull fracture was successfully done with cup of breast pump .

Surgical intervention is recommended where depression involves full thickness of adjacent normal skull³ or where the depression is deeper than 5mm^{7,2} or in any definite evidence of dural perforation.³ Surgical options include minimally invasive burr hole technique. Non surgical intervention has the advantage of being least invasive, simple and safer as it avoids the complications of anaesthesia and craniotomy. Resultant scalp oedema is temporary and resolves spontaneously.

Conclusion

Although depressed skull fractures are rare but radiologists should be aware of the entity as they can be the first ones to make its diagnosis and can play part in deciding its management options by giving depth of depressed bone.

Conflict of interest: None

Ethical committee: approved the case report

References

1. Brittain C, Muthukumar P, Job S, Sanka S. Ping pong fracture in a term infant. *Case Reports*. Mar 2012; 2012: bcr0120125631.
2. Pollak L, Raziell A, Ariely S, Schiffer J. Revival of non-surgical management of neonatal depressed skull fractures. *Journal of paediatrics and child health*. Feb 1999; **35(1)**: 96-7.
3. Kim YJ, Lee SK, Cho MK, Kim YJ. Elevation of depressed skull fracture with a cup of breast pump and a suction generator: a case report in technical aspects. *Journal of Korean Neurosurgical Society*. Oct 2007; **42(4)**: 346.
4. Flannigan C, O'Neill C. Faulty fetal packing. *Case Reports*. Jan 2011; **2011**: bcr0220113802.
5. Fantacci F, Capozz D, Romano V, Ferrara P, Chiaretti A, Massimi L. Spontaneous ping-pong fracture in newborns: case report and review of the literature. *Signa vitae: journal for intensive care and emergency medicine*. Apr 2015; **10(1)**: 103-9.
6. Sorar M, Fesli R, Gurer B, Kertmen H, Sekerci Z. Spontaneous elevation of a ping-pong fracture: case report and review of the literature. *Pediatr Neurosurg*. 2012; **48**: 324-6.
7. A M Koko, NJ Ismail, Lasseini A, B.B Shehu (2020). Successful Non-Operative Treatment of Congenital 'Ping-Pong' Fracture in a New-born Delivered by Caesarean Section. *Am j Surg Case Rep*, doi:10.31487/j. AJSCR