

**ENDOSCOPIC ASSISTED KEY HOLE SUTURECTOMY IN CRANIOSYNOSTOSIS: A  
CASE REPORT**

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**ABSTRACT**

Endoscopic assisted key hole suturectomy is for children with a condition called craniosynostosis, which is the early closure of sutures of the skull. The skull is made up of different plates, and in babies, these plates are separate. Sometimes a baby is born with one or more of these sutures closed. Craniosynostosis can cause a problem with the growth of the skull, and may cause problems with the pressure inside the brain. Children with craniosynostosis need surgical treatment. Traditionally, craniosynostosis operations are usually quite large and leave a large scar at the top of the head. The operation involves taking a big piece of the bone off and putting it back into a different position. We often call these remodeling operations; they are established and very good, but as you can imagine they are quite big, they take many hours, involve a big scar, long hospital stay and usually some blood loss. So there has been an increasing interest in looking at a surgery that's less invasive, with smaller scars and shorter operating times. This actually has led to re-exploring an operation which is the idea of doing a suturectomy. Surgeon would remove a piece of fused bone along the suture, but it became apparent that this would just heal up, and the skull wouldn't change shape. So Surgeons continue to do remodeling operations. However, what has now become apparent is that if you take out a piece of bone, alongside a mechanical device to put pressure on the skull that will cause the skull to grow normally. One of the ways this is done is by using springs, which is an internal device to gradually open up and widen the skull, and it is very successful. Another option is to use a helmet. Nowadays we can do an endoscopic operation (keyhole surgery with a very small incision of 2cm long) to remove a piece of bone. This type of operation takes less than an hour, with very rarely need for a blood transfusion, and only one night in hospital. This is then followed up with postoperative helmet therapy a week later. This uses a helmet specifically made for the child that encourages the skull to grow in the shape you want it to. The helmet needs to be worn for 10 months for 23 hours a day and children tolerate this very well. Here we present an infant with craniosynostosis treated by endoscopic suturectomy.

**KEYWORDS:** Endoscopic, Suturectomy.

**INTRODUCTION**

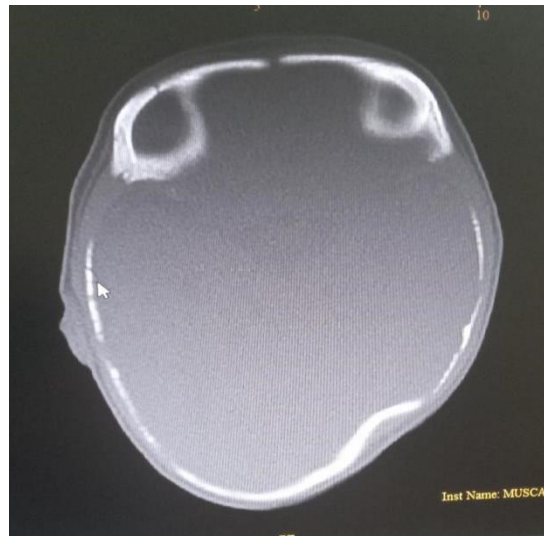
Craniosynostosis is a rare condition that affects approximately one child in every 2,000 live births, and involves pathological fusion of two or more skull bones. Consequences of craniosynostosis include possible limitation of brain growth and cosmetic effects on the appearance of the child. Traditional repairs for these conditions over the past 3-4 decades have involved an open operation with a large skin incision and major manipulations of the skull bones. More recently, minimally invasive endoscopic techniques have been developed to release the skull bones, followed by postoperative treatment with either an external orthosis or internal springs and distractors to achieve the desired correction.

**CASE REPORT**

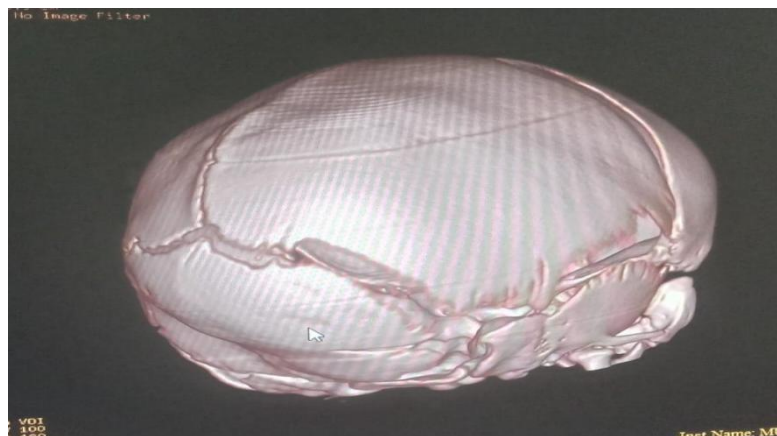
This child 1 month old was seen in our OPD with abnormal skull shape. Patient underwent CT brain with 3 D reconstruction which revealed craniosynostosis involving Sagittal and lambdoid sutures and pressure effects on underlying brain parenchyma. Family was explained of the disease phenomenon and need of suturectomy as further treatment. All possible risks and benefits were explained to the parents. Once parents agreed and patient was fit for the surgery from pre anesthetic assessment, patient was intubated ventilated. After part preparation key hole incisions placed in midline over the sagittal and lambdoid sutures. Endoscope with a retractor blade was brought into position. After two simple burr holes under incisions using the retractor blade of the self illuminating scope the

fused sutures were cut open using a dissecting scissor in its entirety. Sagittal and lambdoid sutures were opened safeguarding the underlying dura. Haemostasis was maintained and wounds were closed in layers. Post

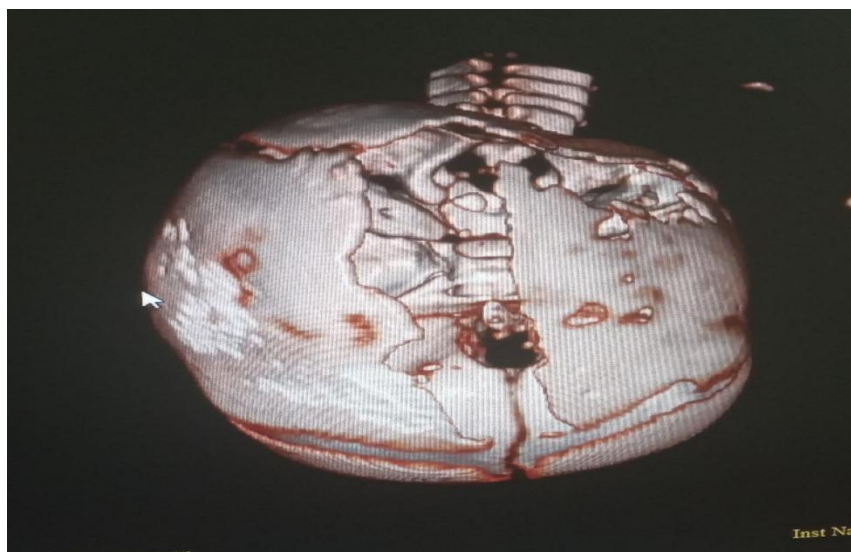
operative check scan were fine and baby was discharged home after 2 days with plan to follow in OPD and orthotic department.



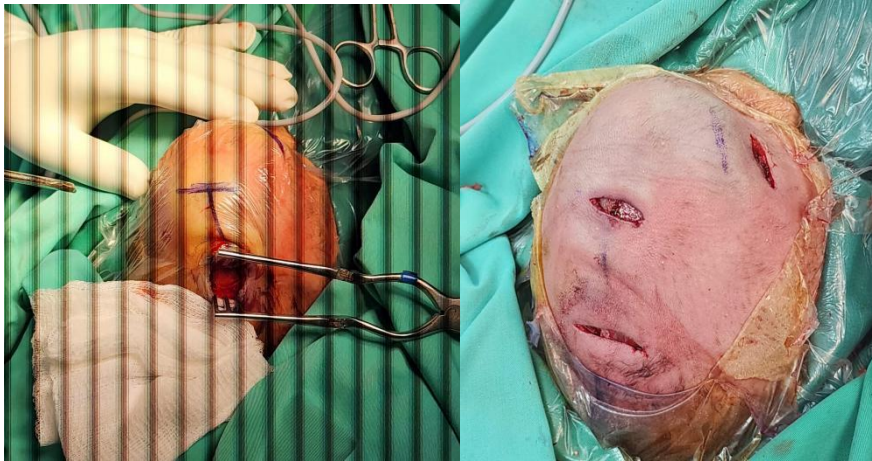
**Fig. 1: CT scan showing lambdoid craniosynostosis.**



**Fig. 2: CT 3 D reconstruction showing sagittal craniosynostosis.**



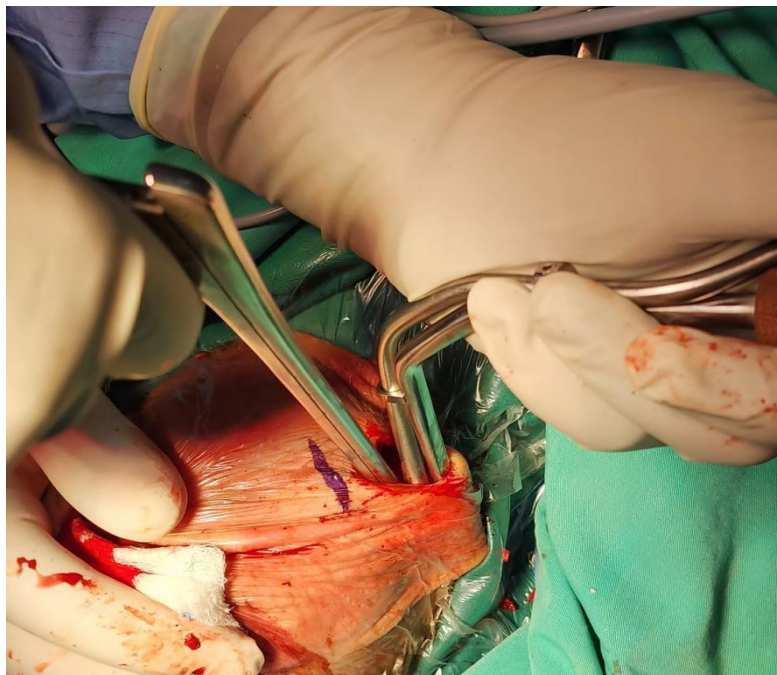
**Fig. 3: Post op CT 3 D reconstruction showing post suturotomy wide open sutures.**



**Fig. 4:** Scalp incisions for the suterectomy.



**Fig. 5:** Intraop endoscopic suterectomy in progress.



**Fig. 6:** Suterectomy widening with Kerrison punches.

## DISCUSSION

Early treatment of coronal synostosis with endoscopy-assisted craniectomy and postoperative molding helmets leads to significant correction of craniofacial abnormalities, including vertical dystopia, nasal deviation, sagittal misalignment, and ipsilateral proptosis. This treatment method is associated with minimal trauma, blood loss, and transfusion rates, and typically only requires 1 overnight stay. This surgical approach is safe, effective, and associated with excellent results. M W McDermott in 1989 described his experience of key hole craniectomy in correction of sagittal craniosynostosis 1. R Proctor in 2014 described his experience of endoscopic correction of craniosynostosis 2. David F Jimenez in 2002 described his experience of early management of craniosynostosis using endoscopic-assisted strip craniectomies and cranial orthotic molding therapy 3. Same author in 2013 again described early treatment of coronal synostosis with endoscopy-assisted craniectomy and postoperative cranial orthosis therapy: 16-year experience 4. In 2023 Zahara Taheri described their experience of minimally invasive craniectomy and postoperative cranial remolding orthotic treatment in infants with craniosynostosis 5.

## CONCLUSION

The results of various studies indicate that the early treatment of craniosynostosis with minimally invasive endoscopic strip craniectomies is a safe, efficacious, and valuable therapeutic alternative to the current extensive surgical treatment modalities. The significantly less blood loss, need for blood transfusions, and length of stay and decreased costs make this procedure an excellent early option for treating infants who present with craniosynostosis.

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