

# Reduction of Frontal Sinus Fracture: An Incision-less Technique

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## ABSTRACT

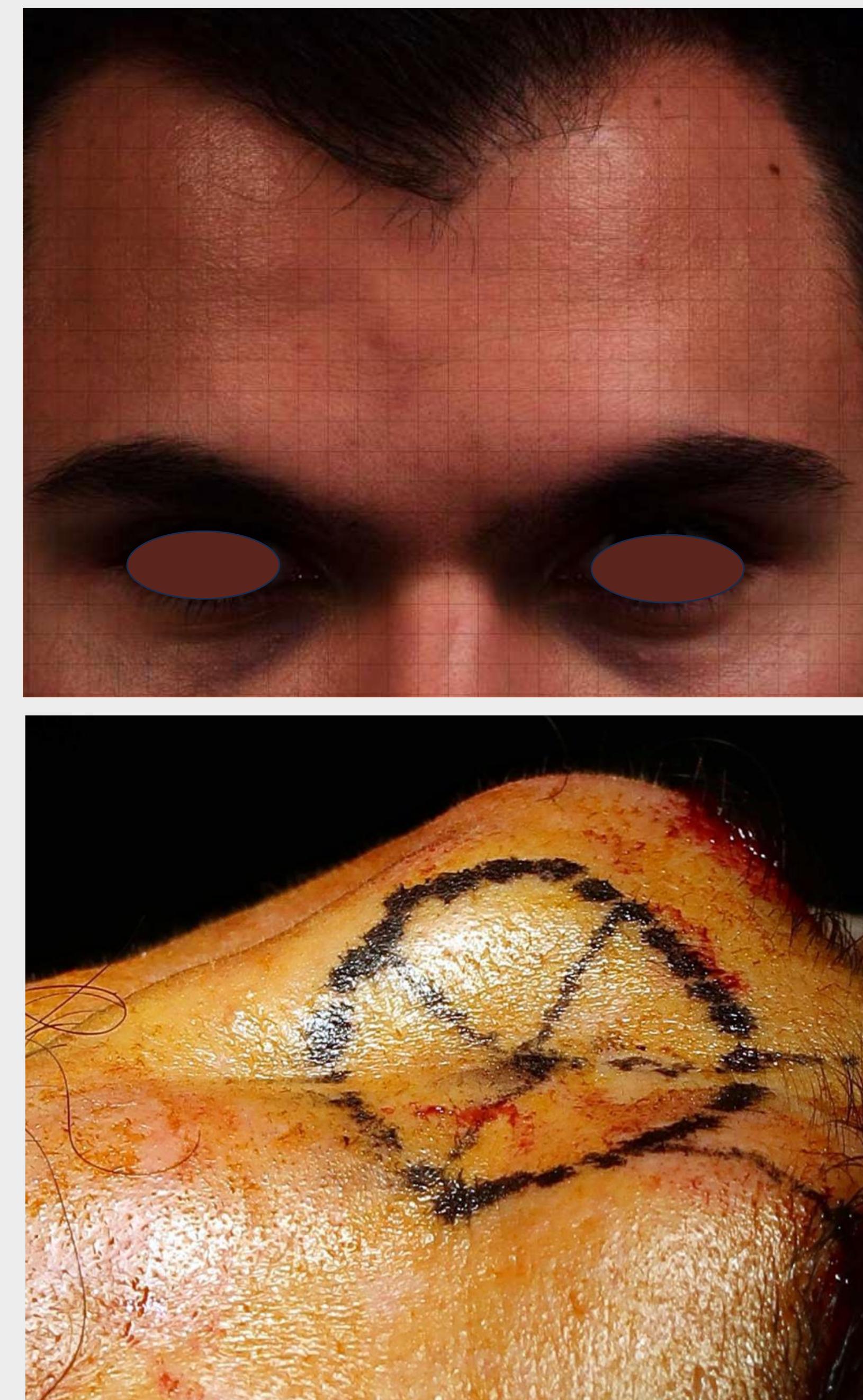
This article introduces a minimally invasive technique for frontal sinus fracture repair using a small sub-brow incision and wire fixation via venous catheters. Applied to a 25-year-old trauma patient, the method avoided large incisions while restoring contour and function. Two months postoperatively, the outcome was aesthetically excellent. This technique offers a cosmetic, effective alternative to conventional open surgery.

## INTRODUCTION

Several key techniques are utilized by surgeons for the management of isolated frontal sinus fractures. Conventional techniques allow for precise control over the alignment of the fracture and help restore the structural integrity and function of the frontal sinus. The major drawback of these time-consuming techniques is the relatively large visible incision. This article describes a novel technique for reconstructing a frontal sinus fracture that minimizes the risks associated with conventional approaches. The patient presented with a depressed frontal sinus fracture following a car accident.

## SURGICAL TECHNIQUE

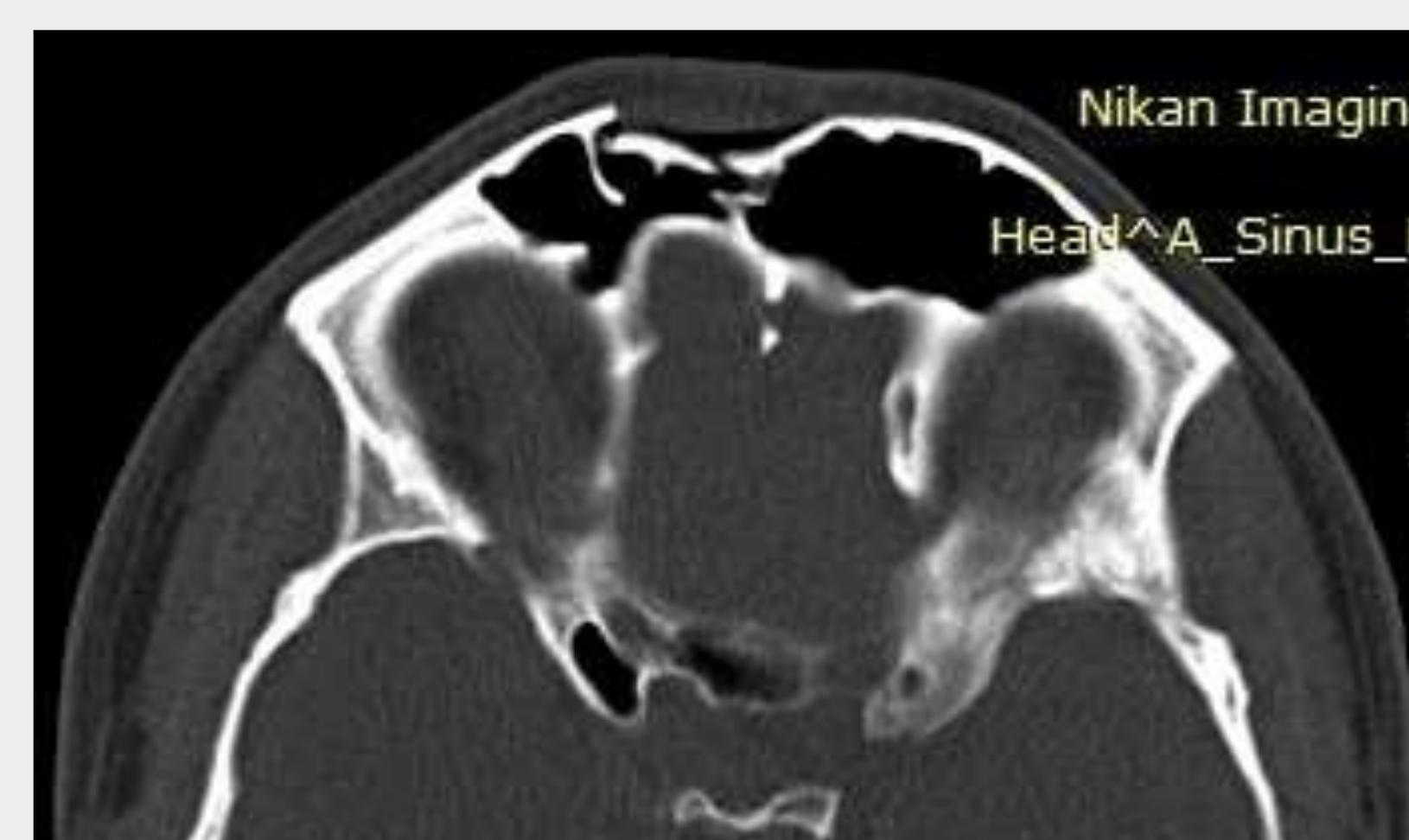
A 25-year-old male patient came to the ENT office four days after a car accident. Clinical examination showed depression of the forehead in the right supraorbital region. Through a small (5 mm) sub-brow incision, a freer elevator was placed under the fractured parts and pulled up. A 16-gauge venous catheter was inserted horizontally from the lateral part of the bone and brought out from the medial part of the bone. After that, a wire (gauge 24) was passed from the catheter, and then the catheter was removed. The same procedure was done vertically, and the same catheter was passed from the inferior to the superior portion. The same wire was placed. The ends of the wires were fixed to each other on 4 pieces of wooden tongue blade. Two months after surgery, the patient has an aesthetically perfect appearance, and the frontal bone contour is maintained without any functional disorders.



Preoperative appearance



Three-dimensional CT reconstruction



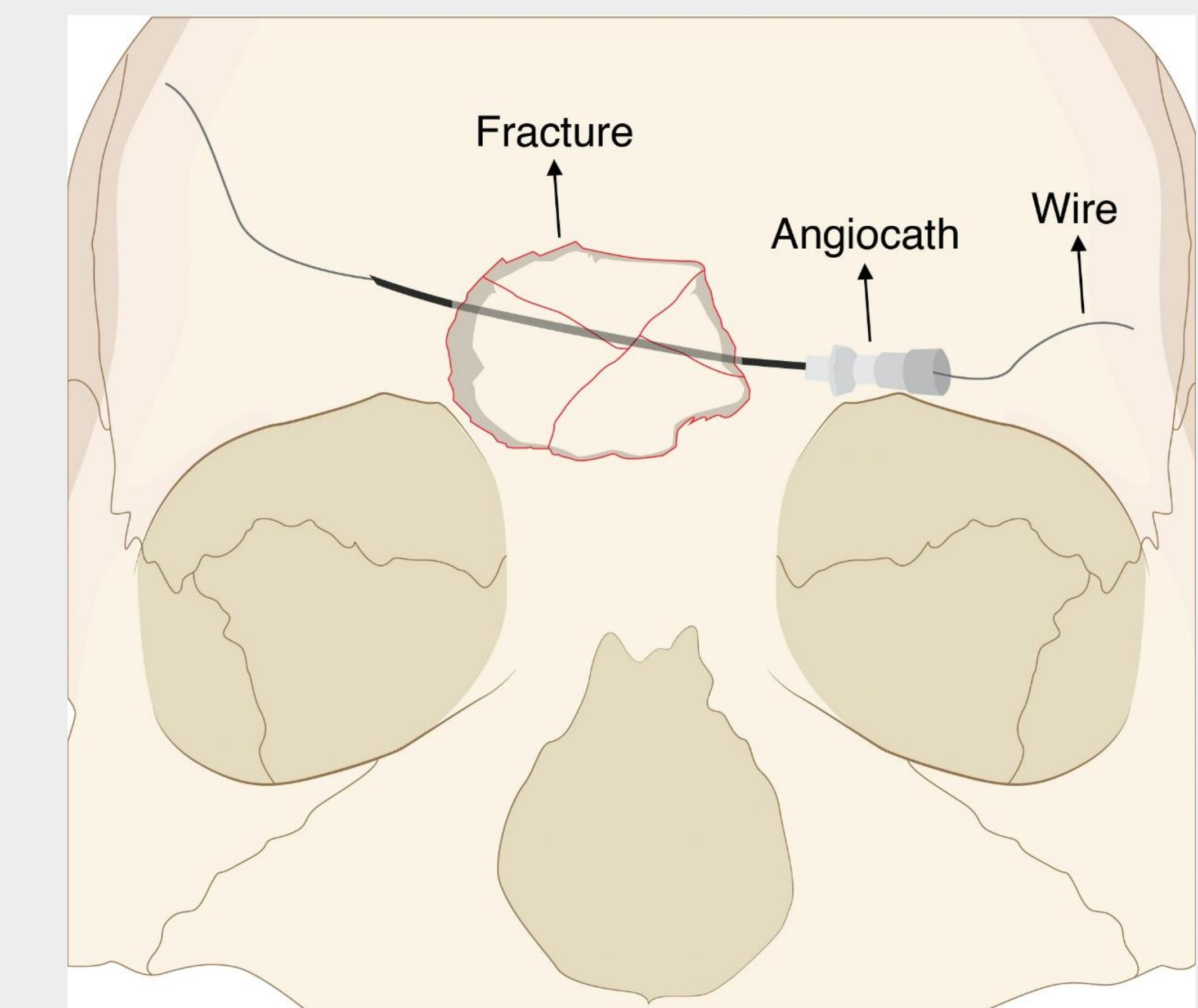
CT images, bone window, axial view



Operative view of fixed wire

## CONCLUSIONS

The surgery was successful, and the patient experienced significant improvement in symptoms following the procedure. The authors attribute the reconstruction's success to the technique's innovative nature and the careful planning and execution of the procedure. In conclusion, this innovative procedure highlights the potential for creative solutions to complex clinical problems in facial reconstructive surgery. This article underscores the importance of individualized care and meticulous planning in achieving successful outcomes for patients with frontal sinus fractures.



Schematic view of surgical procedure



Postoperative view

## REFERENCES

1. Kammien A, Xu Y, Noel OF. Incidence of Frontal Sinus Fractures: A Single-Institution 12-year Experience. *J Craniofac Surg*. 2024.
2. Sert G, Canter HI, Mavili E. Comment on: Minimally Invasive Treatment with a Patient Specific Implant in Reconstruction of Isolated Anterior Wall Fracture of the Frontal Sinus. *J Craniofac Surg*. 2022;33:969.

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