

BACKGROUND

- Unilateral lambdoid craniosynostosis (ULS) is the rarest form of craniosynostosis.
- Patients present with occipital flattening, a mastoid bulge on the ipsilateral side, and a skull base tilted toward the affected side.
- Current procedures are often unable to address cranial base asymmetry leading to unsatisfactory postoperative results.
- We present a novel “Sand-Dollar and Staves” technique, aided by virtual surgical planning, for the repair of ULS.

Pre-Operative Planning

- Three-dimensional (3D) CT scanning was performed in all patients .
- These 3D- images are used to create and test virtual cuts until optimal results were achieved.
- Models and cutting guides are then 3D-printed and are used by the surgical team during the procedure (Fig 1).

Surgical Technique

- A zigzag coronal incision is performed, and an anteriorly-based pericranial flaps are elevated.
- Prefabricated cutting guides are placed and the calvarium is marked.
- To treat the flattening on the ipsilateral side, a wedged suturectomy is performed with additional barrel staves.
- A circle centered over the bulging on the contralateral side is cut out above the open lambdoid suture.
- This piece is barrel staved in a radial fashion, leaving the center intact and creating a Sand-Dollar appearance (Fig 2).



Figure 1. 3D-oriented models.



Figure 3. Pre-operative images

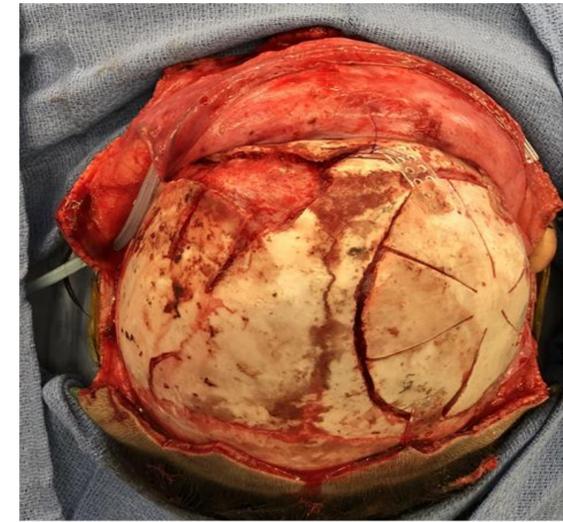


Figure 2. Sand-Dollar and Staves.



Figure 4. Post-operative images

Cont. Surgical Technique

- This disk is then flattened and trimmed. The modified Sand-Dollar is fixed using an absorbable plating system.
- While gentle pressure is applied to the Sand-Dollar piece as it is being secured, the ipsilateral side demonstrates compensatory filling.
- Results are evaluated using the Whitaker Classification.

RESULTS

- Four patients underwent surgical correction with this technique. The procedure was performed at mean age of 11.7 months.
- The mean operative time was 2.5 hours. Intraoperative blood loss was 50-100ml. Total hospitalization time was 2–3 days.
- When the cranial shape was assessed subjectively by both the parents and the surgeon, an acceptable aesthetic outcome was achieved in all cases (Fig 3 and Fig 4).
- No postoperative complications were encountered. Whitaker scores ranged from 1 to 1.5. The mean follow-up was 10 months.

CONCLUSION

- The Sand-Dollar & Staves procedure is a novel, single-stage approach for the management of ULS.
- It has demonstrated decreased operative time, blood loss, and hospital stay with satisfactory aesthetic outcomes.