Swiss Prospective Autologous bone flap Resorption Study (SPARS): An update

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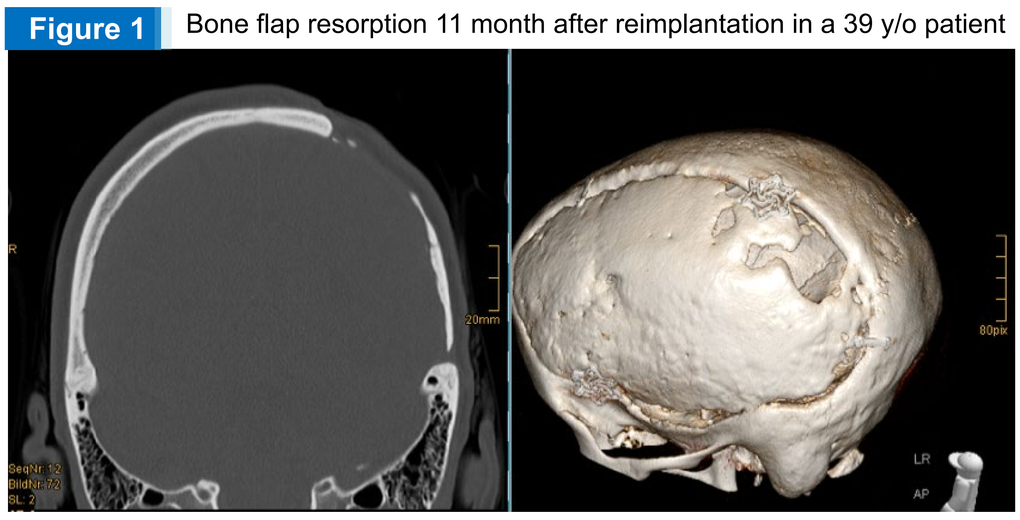
Introduction

Resorption of bone flap after reimplantation following decompressive hemicraniectomy is a well-known problem. Due to mostly short follow-up after reimplantation, the event is likely underreported in the literature. We aim at quantifying the risk of bone flap resorption within the first two years after reimplantation and currently provide a single-site interim-analysis of screening- and study data.

Figure 1 Bone flap resorption 11 month after reimplantation in a 39 y/o patient



Methods

So far, we screened 192 patients that underwent decompressive hemicraniectomy in our institution between Sept 2014 and April 2022 as well as the clinical and radiological follow up one resp. two years after reimplantation of the autologous bone flap. Patients after reimplantation were prospectively enrolled. We performed a 1 resp. 2 year follow up including clinical examination and CT scan. Resorption was classified using a score taking into account clinical (palpable dehiscence, instable flap) and radiological (thickness of flap and dislocation on CT scan) findings. Furthermore, facial symmetry was optically evaluated.

Results

- Out of 192 hemicraniectomies, 129 (67%) got reimplanted
- Mortality after decompressive hemicraniectomy: 25.5%
- 102 patients (53%) agreed to participate in the study. Of those, 65 fulfilled their 12 Mo FU, whereas 21 (**32%**) showed **bone flap resorption** at 12 months after reimplantation. Amongst those who completed the 24 Mo FU (53 patients), 21 patients (40%) presented with significant bone flap resorption.
- Mean patient age: 52.4 y
- Mean duration to reimplantation: 2.9 month
- Indication: CVI (39 patients), SAB (44), aSDH (64), ICB (16), others (29)
- Complications amongst survivors: 6.9% surgical site infections, 2.3% hydrocephalus, 5.6% postoperative hematoma

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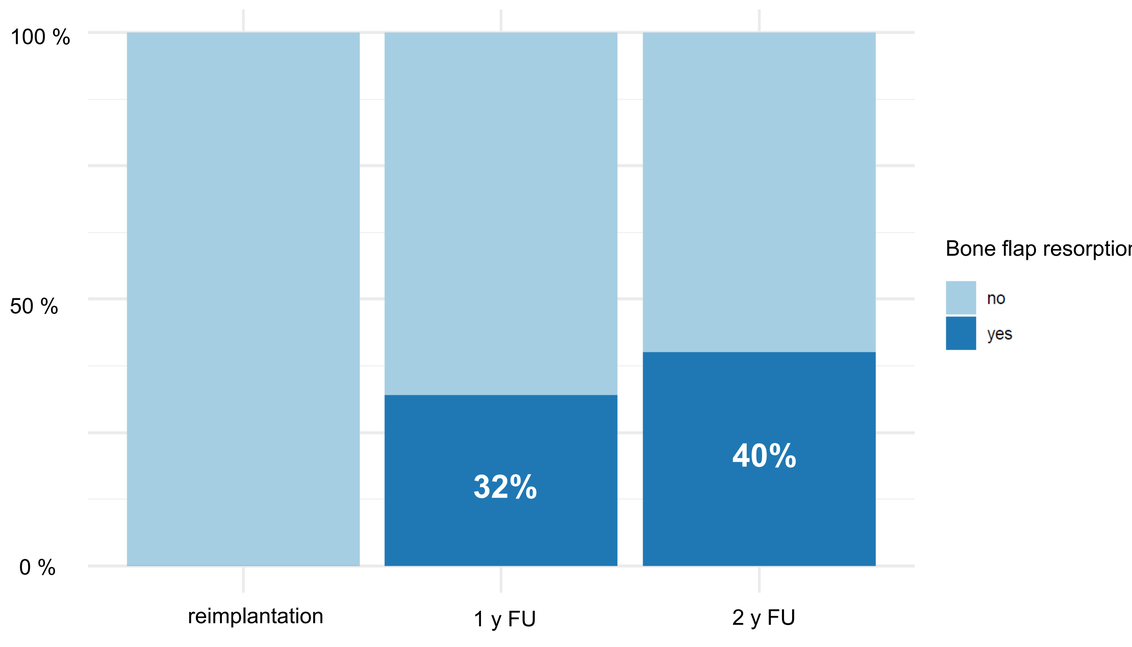
Diagram 1 Bone flap resorption 1 resp. 2 years after reimplantation



Conclusions

Decompressive Hemicraniectomy is a treatment of last resort, which explains the high mortality rate. Amongst survivors, cumulated complication rates after reimplantation of the bone flap are 14.8% (surgical site infections, hydrocephalus, postoperative hematoma). 32% of patients show bone flap resorption 1 year after implantation. This results in an overall complication rate of 46.8% within one year after reimplantation.
Use of CAD-based patient specific implants instead of autologous bone flaps is a viable alternative after decompressive hemicaniectomy, especially in patients of younger age or in case of segmented bone flaps due to an even more frequent resorption of the bone flap reported in the literature, requiring additional surgery in the future.

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