Silastic Sheath Use in Craniectomy and Effect on Subsequent Cranioplasty

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Introduction

Decompressive craniectomy is performed as a life saving procedure after traumatic brain injury or stroke with catastrophic diffuse brain swelling. Reconstructive cranioplasty is performed once brain swelling has subsided. Dense scar tissue can build up between the muscle and dura making the needed dissection prior to replacing the bone flap difficult leading to longer operating room time and increased blood loss. Silastic sheaths can be used to decrease scar tissue formation but no large studies exist validating that this technique or investigating the effect of silastic use on infection rates. Infection remains a major problem with cranioplasty with development of osteomyelitis and brain abscesses leading to major morbidity and mortality. We report our cranioplasty experience to elucidate the affect of silastic use on surgery time, blood loss and incidence of infection.

Methods

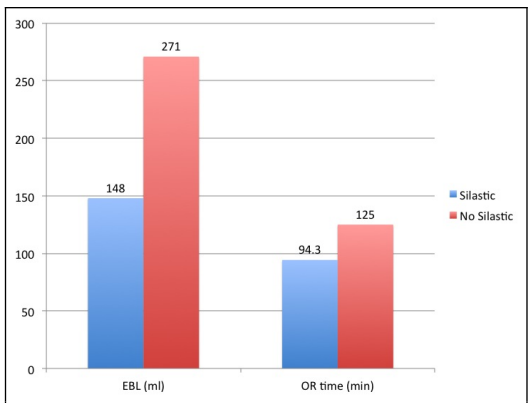
A retrospective review of 112 patients undergoing decompressive craniectomy for trauma or stroke with subsequent cranioplasty at a single center, Ben Taub Hospital between 2008-2012. Patients who had craniectomy performed at Outside hospital were excluded as were patients who had craniectomy performed for infected bone flap. Patients undergoing cranioplasty in conjunction with additional surgical procedure sure as facial fracture repair were excluded from analysis of surgery time and blood loss. Statsitic analysis was performed using student's t-test for Fisher's exact test.

Results

A total of 112 patients were included. There were 21 females and 91 males. Mean age was 37 years and mean follow up was 20 months. Twelve craniectomies were performed due to stroke and one hundred were performed due to trauma.

A silastic sheath was used in 34 patients, no sheath was used in 78 patients. Mean estimated blood loss at cranioplasty was statistically lower in the silastic group at 148 ml compared to 271 ml in the control group (p= 0.004). Mean surgery time at cranioplasty was lower significantly shorter in the silastic group at 94 minutes compared to control group at 125 minutes (p=0.004).

While patients in the silastic group were more likely to form a subgaleal fluid collection (p=0.0013), there was no different in frequency of infection between the two groups (p=0.58). No significant differences were identified between the two groups with regards to number of complications (p=0.82), frequency of use of synthetic implants vs autologous bone flap (p=0.77) and amount of time until cranioplasty performed (p= 0.91)

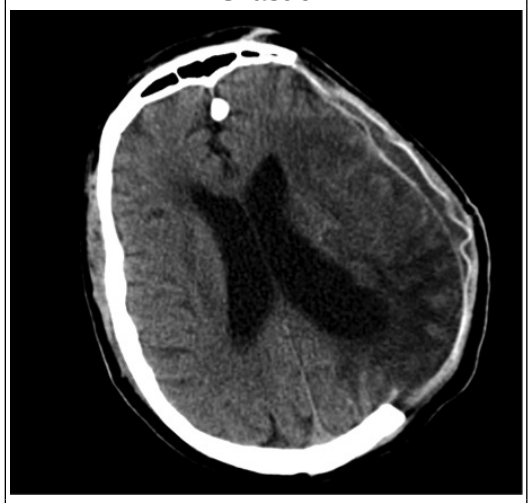


bar chart comparing EBL and OR time

No Silastic

Non Contrast axial CT head: post operative scan after craniectomy without silastic

Silastic



Non Contrast axial CT head: post operative scan after craiectomy with sliastic sheath placement

Conclusions

Placement of a silastic sheath between dura and overlying tissues at time of decompressive craniectomy decreased both blood loss and operating room time at cranioplasty in our series. Use of silastic sheath did lead to higher rate of subgaleal fluid collection at craniectomy site, however there was not an increased rate of infection or other complications at cranioplasty. Our series demonstrates that silastic sheath use as a barrier to scar tissue formation at craniectomy may be a viable method of facilitating subsequent cranioplasty without increase in symptomatic complications, however larger prospective series are needed to further evaluate the use of silastic.

Learning Objectives

By the conclusion of this session, participants should be able to

1) describe challenges in performing cranioplasties
2) describe advantage of utilizing silastic sheath
3) understand and critically evaluate concerns regarding utilization of silastic

References

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