Paediactric burns – staged expander based reconstruction

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Introduction

Burns and the associated tissue scarring, pigment change and contracture present significant difficulties surrounding reconstruction. The aesthetic, emotional and functional impact of burns can be significant, particularly in a paediactric population[1]. Tissue expansion represents a developing treatment method, with great utility in children.

Method

Retrospective chart review of all patients receiving tissue expansion at Royal Children's Hospital over the last decade was conducted, with demographic, treatment indication, expander type and outcome data collated.

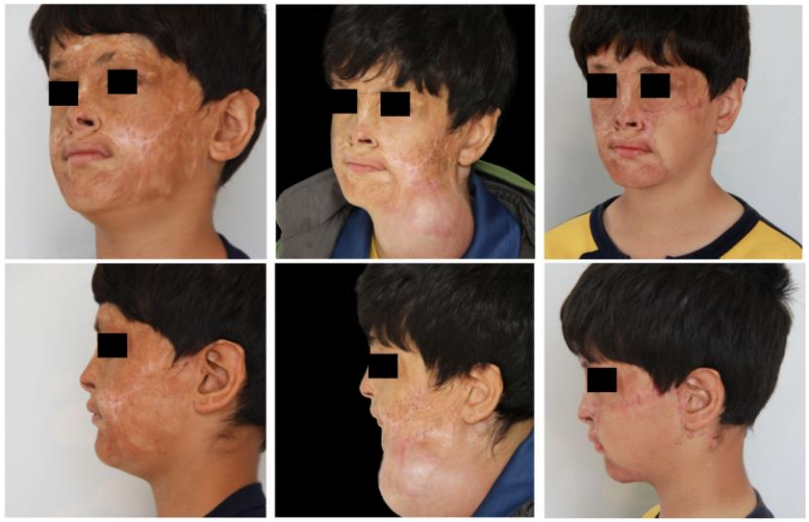

Figure 1. left neck expander reconstruction in a boy with facial burns scars

Results

25 children underwent tissue expansion; 10 males, 15 females (Table 1). 12 patients received osmotic expanders, 13 injectable expanders. In total there were 22 osmotic and 19 injectable expanders. The head and neck was the most common region (22/25 patients) and post burns scarring was the most common indication (9/25). Injectable expanders were used for defects requiring greater tissue expansion (mean 260mL vs 48mL, p=0.001) and had a greater rate of expansion (2.5mL/day vs 0.6mL/day, p=0.001) compared to osmotic expanders. 4 patients experienced a complication for osmotic (33%) vs 3 (15%) for injectable expanders (Table 2). 1 patient with an injectable expander required expander reinsertion. There was no significant difference in complication development based on expander type or indication. 2 patients did not reach 2nd stage reconstruction, 1 from each group of expander reconstruction. 2nd stage reconstruction was not significantly impacted on by expander type, indication or rate of expansion.

		Osmo	Inject	Total
Total (n)		12	13	25
Age				
	Mean	9.0	12.3	10.8
Gender				
	M	6	4	10
	F	6	9	15
Location				
	H+N	11	11	22
	Chest	1	2	3
	UL	0	1	1
Indication				
	Acute burn	4	3	7
	Burns scar	4	5	9
	Alopecia	2	2	4
	Contracture	2	3	5

Table 1. Patient cohort by expander type

		Osmo	Inject	Total
Complication				
	Yes	4	3	7
	>1 comp	1	1	2
	Infection	3	1	4
	Extrusion	1	0	1
	Dehiscence	1	0	1
	Reinsert	0	1	1
2nd stage				
	Achieved	11	12	23

Table 2. Outcomes by expander type

Discussion

The rationale behind using injectable expanders is of greater control of the expansion rate and closer monitoring of patients with respect to complications and readiness for 2nd stage reconstruction[2]. Osmotic expanders grow at standardised rates and decrease the regularity of clinic visits. This serves to decrease the burden on patient and clinician alike after expander insertion, however may result that complications go unmonitored and the rate of expansion is not as controlled. A discrepancy in rate of complication for osmotic vs injectable expanders was not observed (33% vs 15%, p=0.57). The overall complication rate of 28% was comparable to the 24-30%[3,4] rate quoted in the literature. In this study osmotic expanders had a significantly lower absolute growth rate, however this was not the case when relative growth rate was considered as injectable expanders were typically used to generate larger tissue expansion for larger defects.

Conclusion

Burns and burns sequelae are effectively managed by tissue expansion. Osmotic expanders are typically used for smaller defects. There is no difference in overall complication rate or achieving 2nd stage reconstruction for each expander type or indication.

References

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