

Analysis Of Routine Intensive Care Unit Admission Following Palatoplasty In Patients With Robin Sequence

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BACKGROUND

- Robin Sequence (RS) is a set of congenital birth anomalies that annually affects 1 in 8,500 to 14,000 infants worldwide
- Triad of micrognathia and glossoptosis, and upper airway obstruction (UAO):
 - + Cleft Palate (CP) in 66 to 90% of cases
- If conservative management of UAO fails, mandibular distraction osteogenesis (MDO) and tongue lip adhesion (TLA) are common surgical modalities that open the upper airway

OUTCOMES

- Determine if postoperative events after palatoplasty in patients with RS varies according to prior upper airway management
- Determine if routine postoperative PICU admission is warranted

METHODS

- Retrospective review of patients with RS who underwent palatoplasty between 2006-2020.
- Outcomes were compared based upon their prior airway management

RESULTS

- Fifty-eight patients were included.
- Median age at palatoplasty was **12.9 [10.8, 15.6] months**.

Table 1: Demographics and important perioperative characteristics between the study groups

Demographics & perioperative characteristics	Overall (N= 58)	Conservative (N= 30)	TLA (N= 14)	MDO (N= 14)	P value
Median (IQR) or n (%)					
Age (months)	12.9 [10.8, 15.6]	11.2 [9.8, 13.7]	14.4 [13.3, 16.6]	15.4 [11.6, 18.7]	0.002
Weight (kg)	9.2 [8.1, 10.1]	8.8 [8.0, 9.5]	9.9 [9.2, 10.9]	8.9 [7.8, 10.7]	0.026
Female, n (%)	23 (39.7)	9 (30.0)	8 (57.1)	6 (42.9)	0.215
Syndromic, n (%)	30 (51.7)	10 (33.3)	9 (64.3)	11 (78.6)	0.013
Palatoplasty type, n (%)					
Furlow	14 (24.1)	4 (13.3)	6 (42.9)	4 (28.6)	0.088
V-Y	44 (75.9)	26 (86.7)	8 (57.1)	10 (71.4)	
ASA, n (%)					
1	6 (10.3)	5 (16.7)	1 (7.1)	0 (0.0)	0.190
2	27 (46.6)	14 (46.7)	4 (28.6)	9 (64.3)	
3	25 (43.1)	11 (36.7)	9 (64.3)	5 (35.7)	
Additional procedures, n (%)					
None	18 (31.0)	8 (26.7)	4 (28.6)	6 (42.9)	0.243
One	33 (56.9)	20 (66.7)	6 (42.9)	7 (50.0)	
Two	7 (12.1)	2 (6.7)	4 (28.6)	1 (7.1)	
Surgery duration (min)	105.5 [84.8, 129.7]	103.0 [79.5, 121.0]	125.5 [111.2, 140.7]	99.5 [86.0, 137.3]	0.058
Anesthesia duration (min)	176 [150.3, 213.0]	159.5 [144.7, 194.2]	212.0 [194.0, 251.0]	162.0 [152.7, 227.5]	0.004
Intra-operative locals (mg)	30.0 [25.0, 42.5]	25.0 [20.6, 30.0]	48.8 [40.6, 71.2]	30.0 [25.0, 34.4]	0.002
IVF (ml/ kg)	25.5 [19.2, 32.2]	22.8 [18.0, 31.5]	25.9 [22.8, 28.5]	30.6 [24.6, 33.7]	0.275
Post-op PICU care, n (%)	34 (58.6)	10 (33.3)	12 (85.7)	12 (85.7)	<0.001
Intra-op fentanyl (mcg/kg)	2.5 [1.1, 3.6]	2.6 [1.5, 4.5]	2.5 [1.5, 3.5]	2.0 [0.9, 3.1]	0.440
Total MME Dose	0.3 [0.1, 1.2]	0.5 [0.1, 1.3]	0.6 [0.2, 1.2]	0.2 [0.1, 0.4]	0.337
Acetaminophen (mg/kg)	107.5 [70.3, 148.5]	75.0 [55.3, 138.8]	124.4 [93.7, 181.4]	120.2 [74.2, 145.9]	0.187
FLACC score (1 hour)	3.0 [0.0, 6.0]	2.0 [0.0, 5.0]	3.5 [0.5, 6.0]	3.0 [0.0, 8.8]	0.394
FLACC score at (6 hours)	2.7 [1.0, 4.0]	1.7 [1.0, 3.8]	3.3 [1.4, 4.7]	2.8 [0.7, 5.6]	0.489
FLACC score (total stay)	2.1 [1.4, 2.6]	1.9 [1.1, 2.4]	2.1 [1.9, 3.2]	2.0 [1.4, 2.6]	0.331
Length of stay (hours)	48.4 [32.7, 74.2]	34.6 [29.1, 55.5]	53.7 [47.5, 78.4]	57.3 [48.5, 81.1]	0.024



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Table 2: Comparison of airway and non-airway outcomes between the study groups.

Complications	Overall (N= 58)	Conservative (N= 30)	TLA (N= 14)	MDO (N= 14)	P value
Non-airway complications, n (%)	13 (22.4)	8 (26.7)	1 (7.1)	4 (28.6)	0.320
- Prolonged time to feeding (>24 hours)	7 (12.1)	4 (13.3)	1 (7.1)	2 (14.3)	0.999
- Unexpected gavage feeding	1 (1.7)	1 (3.3)	0 (0.0)	0 (0.0)	0.999
- Transfusion	1 (1.7)	1 (3.3)	0 (0.0)	0 (0.0)	0.999
- Fistula	2 (3.4)	2 (6.7)	0 (0.0)	0 (0.0)	0.999
- Readmission	4 (6.9)	2 (6.7)	0 (0.0)	2 (14.3)	0.531
Airway complications, n (%)	25 (43.1)	8 (26.7)	9 (64.3)	8 (57.1)	0.034
- Prolonged intubation (>4 hours)	3 (5.2)	1 (3.3)	2 (14.3)	0 (0.0)	0.283
- Reintubation	4 (6.9)	2 (6.7)	1 (7.1)	1 (7.1)	0.999
- Mechanical ventilation	5 (8.6)	2 (6.7)	1 (7.1)	2 (14.3)	0.826
- Supplementary oxygen via non-rebreather mask, nasal cannula, aerosol mask, previous tracheostomy	12 (20.7)	4 (13.3)	4 (28.6)	4 (28.6)	0.338
- Length of stay > 2 days	18 (31.0)	6 (20.0)	6 (42.9)	6 (42.9)	0.161

PICU admission significantly higher in patients who underwent TLA and MDO (conservative, 33.3%; TLA, 85.7%; MDO, 85.7 %; p<0.001).

Rates of overall airway-related complications significantly higher in patients with prior TLA and MDO (conservative, 26.7%; TLA, 64.3%; MDO, 57.1%; p=0.034).

Rates of major post-PP airway events were low and insignificant between groups (0-14.3%; p>0.05).

Post-hoc analysis documented significant differences only in **overall** airway complications between TLA vs. conservative airway groups (64.3% vs. 26.7%; p=0.02).

Rates of non-airway complications were not statistically significant different among the groups.

CONCLUSION

- ICU care after PP in patients with RS may not be necessary in infants whose airway obstruction was appropriately managed by conservative measures alone or by MDO, potentially preserving resources for patients with greater need. Special attention may be prudent for patients after PP who underwent neonatal TLA.

