

Table 1. Incidence or severity of palatal grooving, relation to intubation time. Exclusion criteria was only given by [7].

| studies | Study group / Control group / study design | Method and validity | Results |
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| [24] | - 25 children, aged 2-5 Y, GA 29.3 +/-4.1 (range 24-32 W), mean BW 1089 +/- 420 g. (range 530-1828 g.), mean length of orotracheal intubation 34 +/- 28.2 D, range 7-90 D | - Dental casts, using a thermoplastic material. | - At 2- 5 Y, 100 % had a high palatal vault. - 28 % had palatal grooving. - 16 % had a posterior crossbite. - Intubation ≤ 15 D: no grooving, no posterior crossbite. - Intubation ≥ 30 D: higher incidence of grooving and posterior crossbite than those intubated ≤ 30 D - Palatal groove after 85, 65, 65 D |
| [30] | - 3 vlb. infants: - 1: 870 g. BW, 26 W GA, 45 D of nasotracheal intubation, at 93 D attempts of oral feeding became successful - 2: 1040 g. BW, 28 W GA, nasotracheal tube for 6 H, at 7 W of age partial oral feeding, at 75 D full oral feeding - 3: 94 g. BW, 28 W GA, nasotracheal intubation for 15 D, supplemental oxygen by hood until 40 D, oral feeding initiated at 56 D of age, withdrawal of orogastric tube at 65 D - <u>orogastric feeding tubes</u> (no. 5, polyethylene) for 108, 75 and 65 D | - Visual inspection. | |
| [5] | - n = 1 PT infant (sex not given, 1049 g, GA 26 W) - Orotracheal intubation at 1 minute of life, PDA at two D of age, ligated on 4 th D, orotracheal tubes were changed every 3- 7 D, patient died at 95 D of age. | - Probably visual clinical inspection. | - ‘Deep palatal groove’ at extubation . |
| [5] | - 1 M infant, 33 W GA, BW 1920 g. - Intubation for 90 D (70 D with a tube of a diameter of 4.0 cm, four D 3.5 cm, 16 D 3.0 cm) and 6 D with nasotracheal tube, infant sucking on the tube on many occasions. | - Probably visual clinical inspection. | -High arched palate at 70 D, cleft at 90 D -16 weeks postextubation palatal deformity growing smaller. |
| [5] | - 1 F infant, 32 W GA, BW 990 g. - Intubation with 3.0 mm Portex tube for 50 D | - Probably visual clinical inspection. | -At extubation (50 D) cleft of hard palate. -At four MO no noticeable closure of cleft. |
| [5] | - Six infants intubated > 50 < 90 D | - Probably visual clinical inspection. | -No palatal deformity. |
| [6] | - 63 neonates and infants who required orotracheal intubation for 1- 62 D prior to the making of the maxillary cast. - Weight 580 g - 4400 g (42 <1500 g). - 43 (68 %) had the maxillary impression taken during the first W of life. - Sex, GA and BW not given. | - Impression of maxillary arch (thermal plastic compound, specially developed acrylic tray) (43 (68%) had the maxillary impression taken during the first W of life) . - Master cast (dental stone). - Visual inspection of palatal grooving (defined as a narrow channel of variable depth located near the midline of the palate). - No validity of the method was given. | -Palatal grooving in 30 (47.6 %) infants; -Intubation < 7 D (n=43) ⇒ 17 (39.5 %) palatal groove. -Intubation 8-14 D (n=12) ⇒ 6 (50.0 %) palatal groove. -Intubation >15 D (n= 8) ⇒ 7 (87.5 %) palatal groove. |
| [6] | - 106 neonates and infants (720-4500g.). - (69 < 1500g) (48 (53 % < 7 D) with an orogastric tube for 1– 50 D. - Sex, GA and BW not given. | - See above. | - Out of 106: - 100 had no palatal groove at the time of the initial impression; - Other 6 had previously had an orotracheal tube for up to 757 H |
| [32] | - 26 clinically stable PT, GA 24- 36 W, < 24 H of age, randomized in - control group (n=14) without palatal stabilizing device (PSD) within 24 H of intubation, mean BW 941.4 +/- 271.8 g, mean duration of intubation 38 +/- 28 D and | - Postextubation palatal impressions on acrylic trays within 24 hours after removal of endotracheal tube. - Observation and measurement of palatal | - No significant intergroup differences with respect to BW, mean duration of intubation (no data on comparison of groups with respect to GA given). - None of children in PSD group showed any evidence of palatal |

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| <p>- experimental group (n=12), with cold-cure methyl-methacrylat PSD, mean BW 989.2 +/- 379.2 g, mean duration of intubation 33 +/- 20 D</p> | <p>groove depth by using a boley gauge by a blinded dentist. - Groove \geq 0.5 cm was considered significant - T-test for comparison of mean BW and duration of intubation. - Correlation coefficient to analyze relationship between period of intubation and groove depth.</p> | <p>grooving. - All 14 infants in control group experienced grooving from 2- 7 mm in depth: 64 % > 5 mm, 36 % < 5 mm. - Infants intubated > 30 D = most severe grooving patterns. - Infants who were most at risk for palatal grooves = infants intubated > 2 W. - Correlation coefficient between intubation period and groove depth $r = .92$.</p> |
| <p>[7] - 60 VLBW infants without palatal abnormalities requiring orotracheal intubation (20 therefrom excluded (8 intubated < 5 D, 7 died, 5 required different endotracheal tube)), thus randomized - 22 children without palate plate (mean BW 852 g. (175), mean GA 26.7 W (1.7), average of 29.1 (21.1) D of intubation. - 18 children with palate plate (mean BW 920 g (196), mean GA 27.7 W (1.6), average of 27.1 (18.7) D of intubation.</p> | <p>- Maxillary casts within 5 D of initial orotracheal intubation and within 1 W after extubation. - Evaluation of casts by 3 blinded examiners. - Grading of groove and averaging of results ((1=normal, 2=mild, 3= moderate, 4 = deep (\geq 5 mm)). - Differences between groups (BW/ GA/ length of intubation): student t test. - Differences between groups (impressions/ length of intubation): analysis of variance (two way classification, single observation). - Length of intubation vs degree of groove Pearson correlation coefficient.</p> | <p>- No statistical significant differences between groups for mean BW, GA or length of intubation. - Significant difference in rating for initial and final measurements between 3 examiners ($p < 0.05$). - Difference (final-initial) did not differ significantly. - No significant differences in the initial ratings of study and control group. - Palatal grooves and differences between initial and final grading significantly smaller in the plate group. - No correlation between severity of groove and length of intubation in the plate group. - Significant correlation between severity of groove and length of intubation in the control group ($p < 0.05$).</p> |
| <p>[8] - 40 VLBW neonates with orotracheal tubes randomized to - control group (n=22), GA 27.1 +/- 1.6 W, BW 920 +/- 196 g., length of intubation 27.1 +/-18 D and - study group (n=18), GA 26.7 +/- 1.7 W, BW 852 +/- 175 g., length of intubation 29.1 +/-21.2 D fitted with palatal appliance to protect maxillary arch from the orotracheal tube</p> | <p>- Palatal impressions within 5 D of initial intubation and following extubation. - 3 blinded examiners, averaging of their results. - Grading of grooves see above. - Differences between groups (initial and final impressions and length of intubation): analysis of variance.</p> | <p>- No differences between groups for initial grading. - Significant differences between final and final-initial gradings between groups ($p < 0,01$). - Only in the control group did the severity of groove formation correlate with the length of intubation ($p < 0.05$).</p> |
| <p>[14] - Neonates out of a 12 MO period who required intubation and mechanical ventilation, < 2500g; patients < 800 g BW treated with a 2.5 mm internal diameter group, patients > 800 g BW treated with 3.0 diameter; tubes fixed to upper lip and cheek with tape. - Study group: 57 neonates (standard PVC endotracheal tube; 'hard' group (identical internal and external diameters to the soft tube); - Control group: 46 neonates with a modified 'soft' PVC endotracheal tube (identical internal and external diameters to the hard tube).</p> | <p>- Prospective, randomized, blinded study, weekly visual inspection for palatal grooving; in case a groove was present it was measured by a small micrometer from its floor to the surface of the palate at midpoint of the hard palate; - Palatal groove \geq 0.5 cm was chosen to be significant. - If at time of extubation a groove was present it was photographed for comparison during follow up. - Blinded dental exam at ages 9- 75 MO.</p> | <p>- No grooving when mech. vent \leq 7 D. - Palatal grooves regularly after 7 D in infants < 1000 g, neither incidence nor severity of palatal groove formation influenced by the kind of tube. - Development of a groove closely tied to BW: <1000 g 50% (11/22) vs 17 % (3/17) >1000 g and total intubation time. - Of the original 106 infants 3 were excluded due to technical failure with intubation; 4 deaths in the soft tube vs. 1 death in the hard tube group. - 32 % had very high arched palates, no palatal grooves.</p> |
| <p>[1] - 37 infants, BW 1024 +/- 228 g., GA 29 +/- 2 W - 50 % M, 83 % black. - 72 % intubated for 34.5 +/-28.7 D</p> | <p>- Probably visual clinical inspection.</p> | <p>- 'Large palatal groove' after extubation after 70 D</p> |
| <p>[12] - n = 1 PT infant (sex not given) with normal palate at birth (GA 26 W, with</p> | | |

orotracheal tube (changed every 3 to seven D) at three minutes of life,
ventilation for 70 D

[16] + [17] - 40 PT, GA 25-37 W (mean 30.0 +/- 2.6).
- Intubated for 14- 243 D (67.6 +/- 51.1).

- Evaluation for palatal grooving by means of wax impressions of the palate at the time of extubation and six MO later.

- At the time of extubation:
- 37 (90%) with grooves.
- 3 without grooves (GA 29, 31, 31 W, intubated 24, 14, 14 D).

BW = birthweight, D = day(s), F = female, GA = gestational age, GW = gestational weeks; H = hour(s); LBW = low birthweight, M = male, MO = month(s), NBW = normal birthweight, NS = not significant, PT = preterm, VLBW = very low birthweight, W = weeks, Y = year(s).