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Management of Upper Airway and Feeding Difficulties in Infants with Pierre Robin Sequence Using Mandibular Distraction Osteogenesis: Presenting a New Protocol

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Infant Mandibular Distraction

- 13 infants with PRS with or without cleft palate or other anomalies, 7 males & 6 females
  - 9 Cleft palate
  - 1 Cleft lip
  - 2 Treacher Collins Synd.
  - 1 Stickler Synd.
  - 1 Trisomy 18
- Grade II-III Caouette-Laberge airway-feeding classification (3II, 10 III)
  - I Prone & no feeding difficulty
  - II Prone & NG feeding only
  - III ETT with NGT (FTT),
    (2 Tracheostomy, 1 G-tube)
- Age at distraction 8 do - 16 mo (average 4 mo)

Infant Mandibular Distraction

- Preoperative workup
  - 3D CT
  - Sleep Study
  - GER Scan
    - » 9 infants dx with GERD
  - DLB
    - » 4 infants dx with Laryngomalacia
    - » 1 infant dx with Tracheomalacia
  - Genetics consultation
  - ECHO Cardiogram
    - » 5 infants with congenital heart defect

Surgical Technique

- General anesthesia
- Submandibular incisions
- Corticotomies
  - » At the angle of the mandible
  - » Avoid IAN and tooth buds
- Insertion of Neonatal Distractor with micro monocortical screws at the inferior border of mandible
  - » Neonatal KLS-Martin
  - » Logic Jr. OsteoMed
- Wound closed in layers
- Distraction in AP vector


KLS martin L.P.
International Partners

Post Op Care

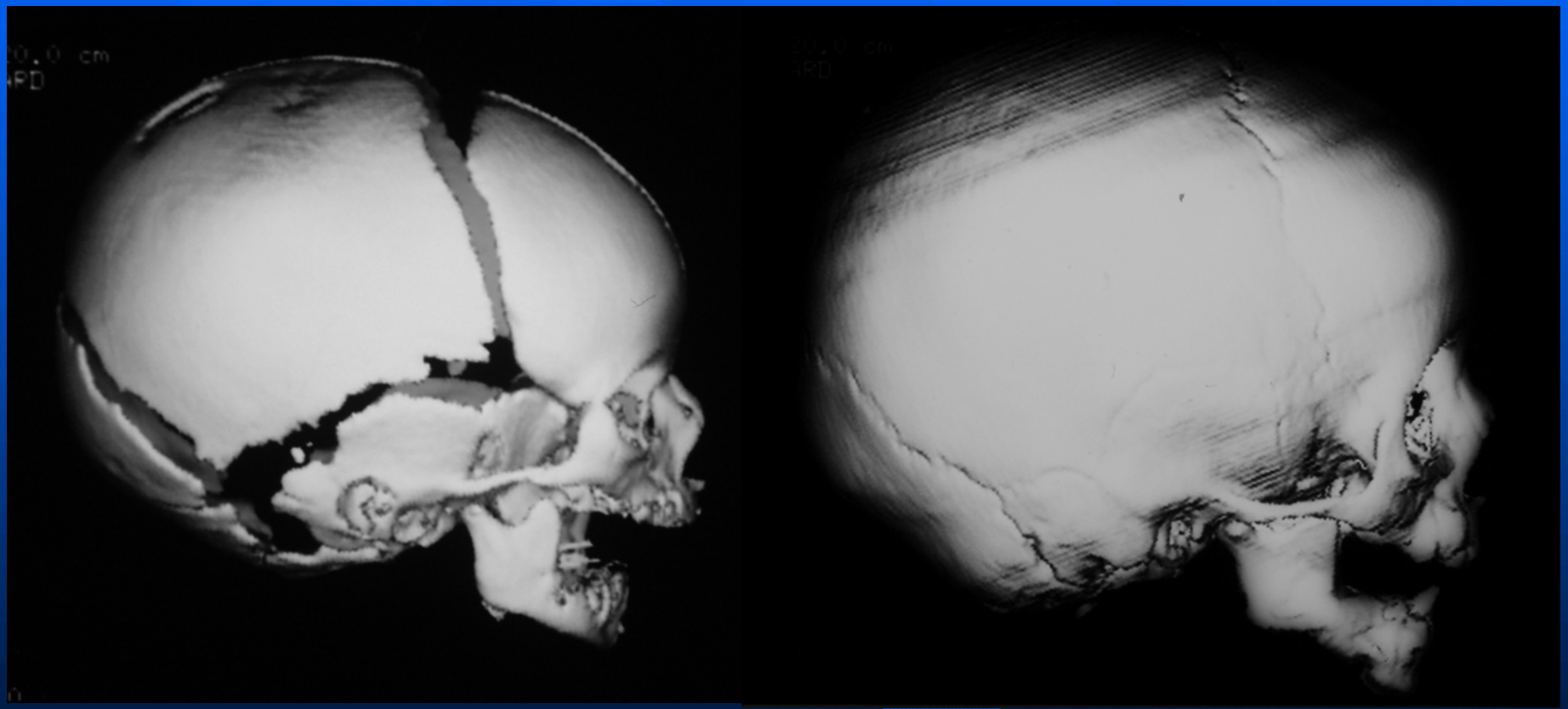
- Admission to ICU
- Distraction completed during hospital course
- Progress followed with mandibular x-rays
- Ultrasound for assessment of consolidation
- Post-Op sleep study
- Post-Op 3D Craniofacial CT after removal of distractors

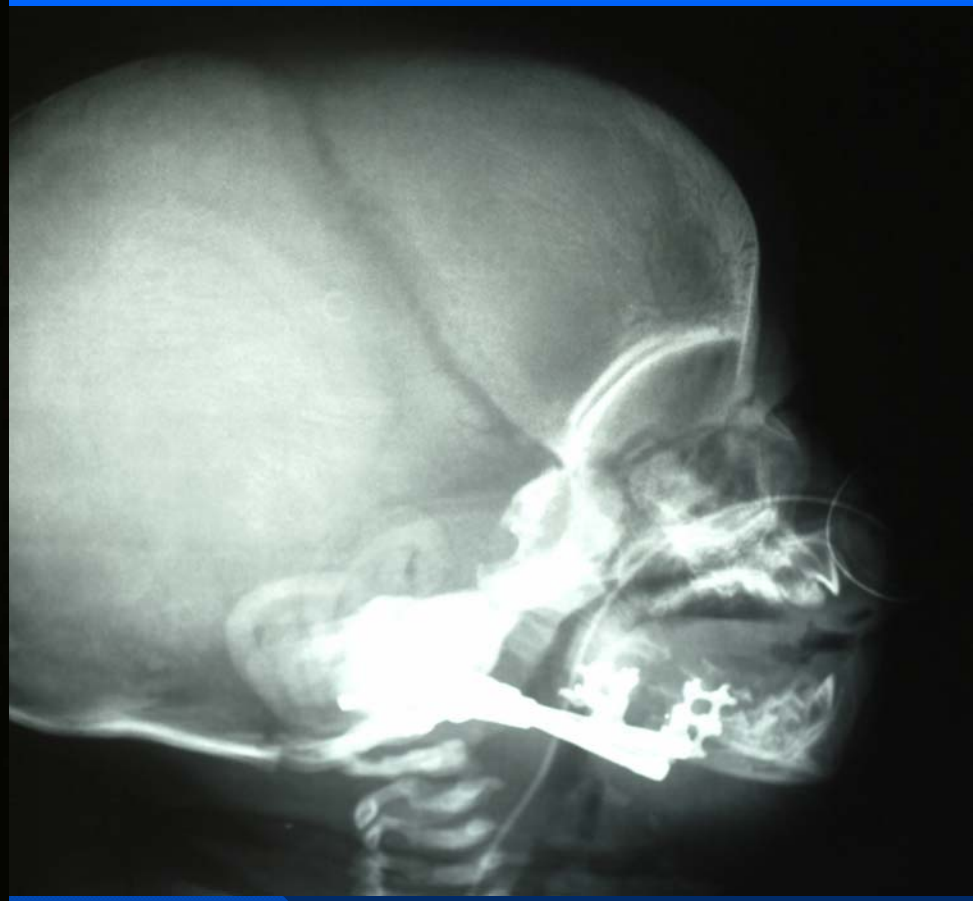
DistractionTechnique

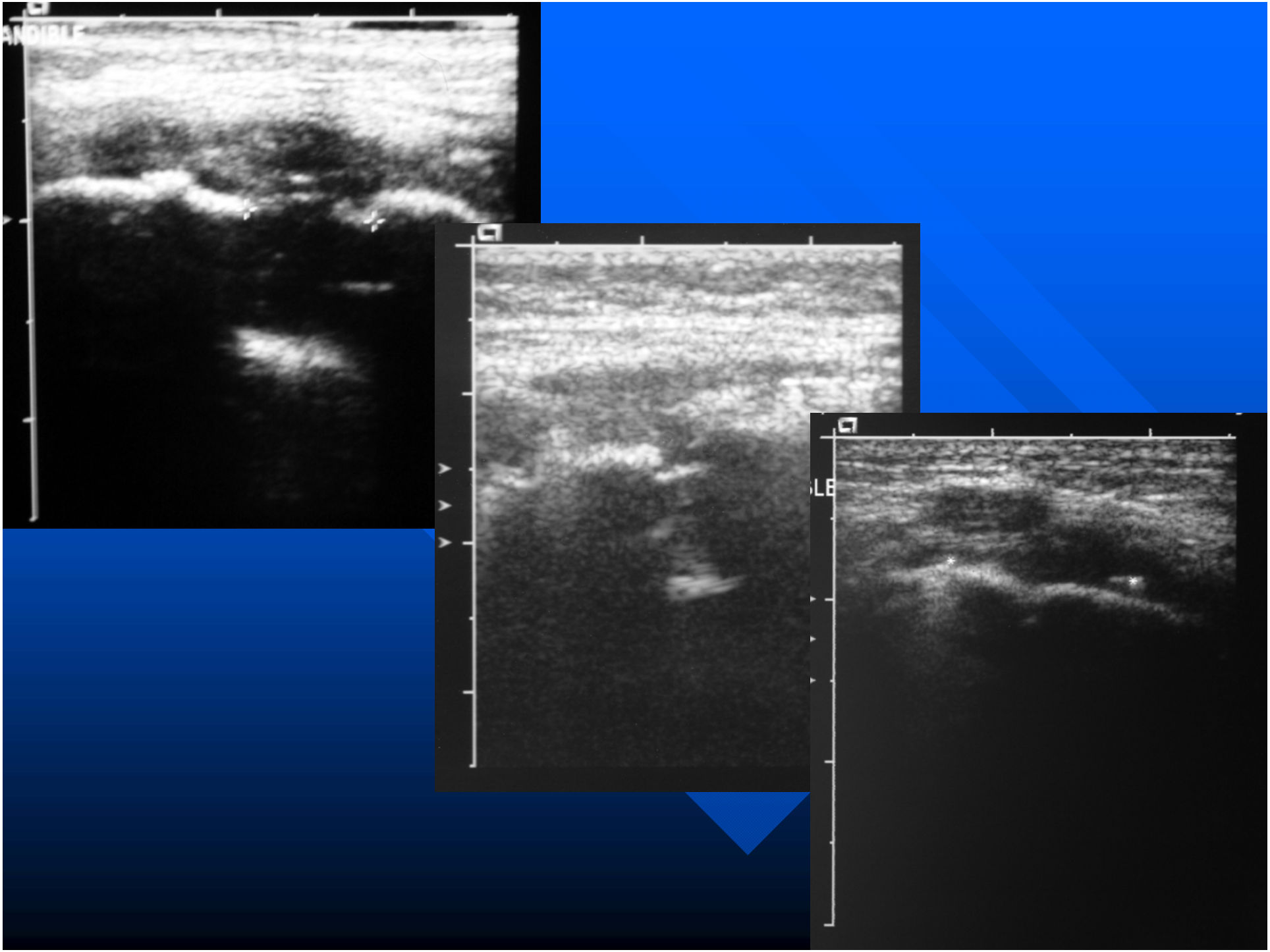
- Latency period of 0-2 days
- Distraction rate of 1.0mm-1.5mm a day
- Distraction to a correct anatomical skeletal class I or class III in severe cases of OSA
- Distraction length 8mm-15mm (11mm)
- Consolidation period 8 wks-20 wks (10 wks)

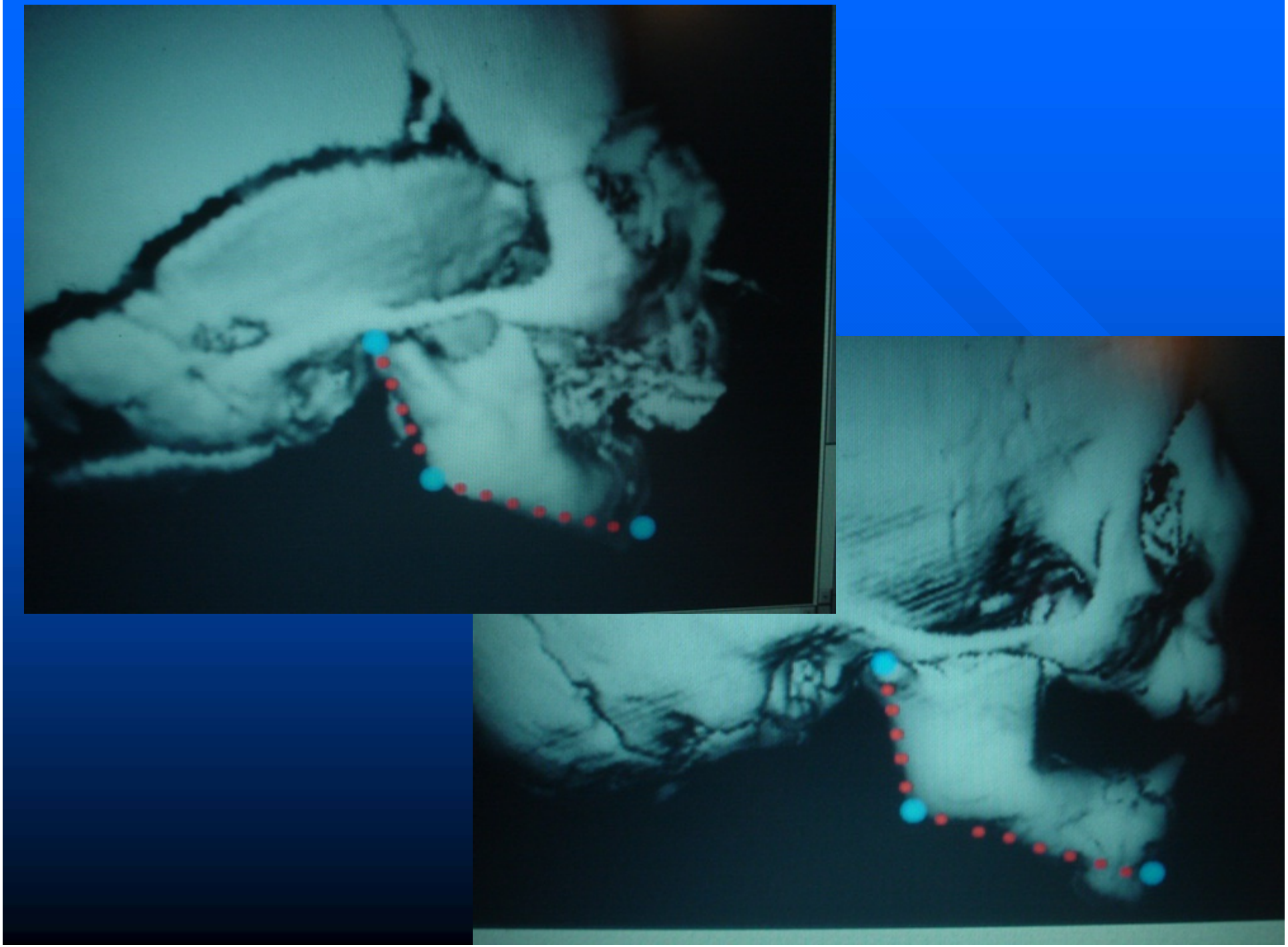
Complication

- One marginal mandibular nerve paresis
- One readmission for pneumonia
- One distractor backed up









AVERAGE MANDIBULAR MEASURMENT

- Pre-distraction
  - Co-Go 17 mm
  - Go-Pg 23 mm
- Post-distraction
  - Co-Go 20 mm
  - Go-Pg 32 mm

Vertical + 3 mm

Horizontal + 9 mm

SLEEP STUDY DATA

	Pre-Op AHI	Post-Op AHI
BG	47	11
CN	9	4
GB	30	9
NJ	37	10
PI	13	2
RR	18	5
SD	37	5
WK	44	12

SLEEP STUDY DATA

- Pre-op average AHI and lowest saturation
  - » AHI 28
  - » Sat. 73%
- Post-op average AHI and lowest saturation
  - » AHI 8
  - » Sat. 85%

Feeding & Weight Pattern Post Operative

- Feeding
  - 10 infants with good PO intake
  - 2 infants with poor to moderate PO intake during the day & NG feeding during sleep
  - 1 infant poor PO intake with G-tube feeding
- Weight gain
  - 11 good
  - 1 moderate
  - 1 poor

Sleep Pattern Post Operative

- 2 tracheostomies decanulated
- 11 patients sleep tolerating room air with no complaints from parents
- 1 patient sleeps on room air with pulse oximeter with infrequent desaturations
- 1 patient sleeps on O2 via nasal cannula and pulse oximeter with infrequent desaturations

Conclusion

- Infant mandibular distraction is a feasible, effective option
  - » Low risk
  - » Technically easy
  - » Well tolerated
  - » Very effective