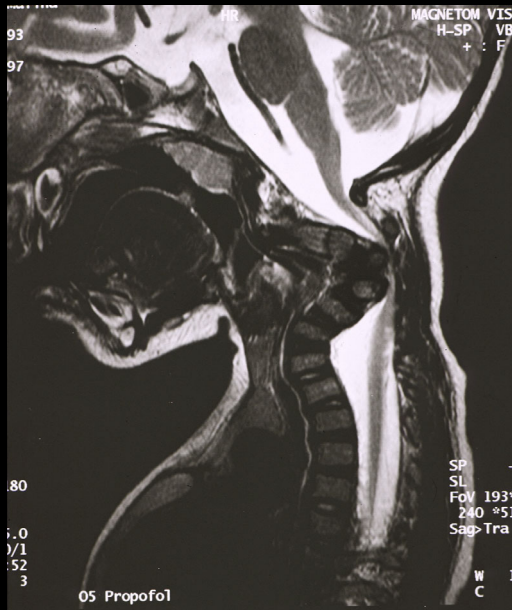


3rd International Congress on Early Onset Scoliosis and Growing Spine

Istanbul, Turkey on November 20-21, 2009.

Management and surgical planning of severe infantile cervical kyphosis



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Introduction

- **Congenital cervical kyphosis may lead to severe neurological deficit in the infant due to cord compression**
- **The choice of surgical procedure and the age at which it is indicated, pose a considerable challenge**

The Problem

**Inappropriate surgical procedure
can produce greater deformity
and neurological damage
despite best intent**

Patients

- ✓ Six infants with cervical kyphosis aged 2 ½ to 7 yrs were treated
- ✓ All 6 patients had posterior cervical fusion previously (5 postsurgery, 1 spontaneous)
- ✓ 4 patients presented with severe neurological deficit up to tetraparesis
- ✓ Larsen's syndrome (2)
- ✓ Congenital deformity (2)
- ✓ Diastrophic Dystrophy (2)

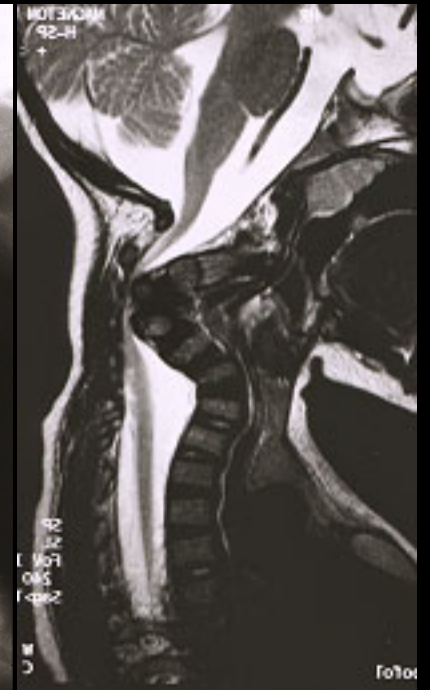
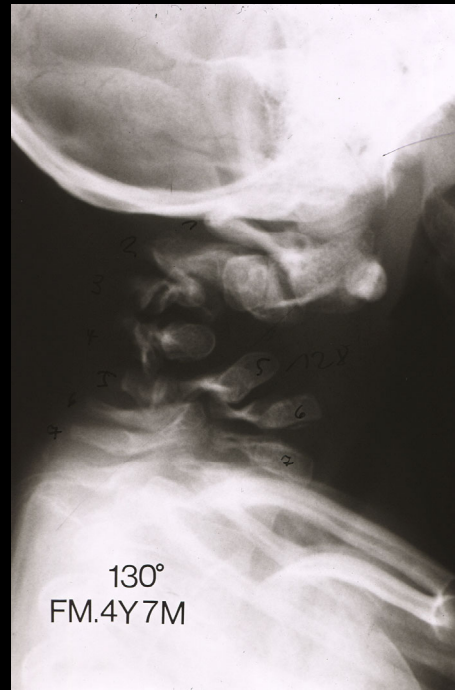
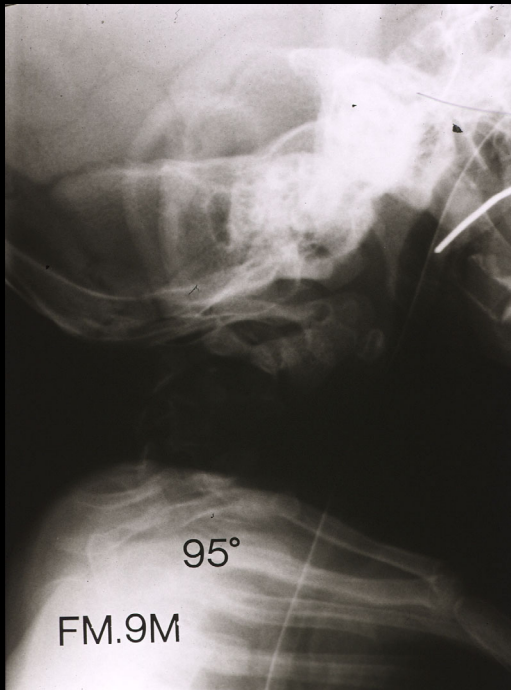
Patients

- ✓ Preop kyphosis: 130° , 125° , 125° , 66° , 60° and 43°
- ✓ 5 patients treated with a combined a-p approach, one patient treated anterior only
- ✓ Cord decompression was performed in all cases
- ✓ Follow-up ranges from 3 – 48 months

Case N° 1

Larsen – Syndrome Kyphosis

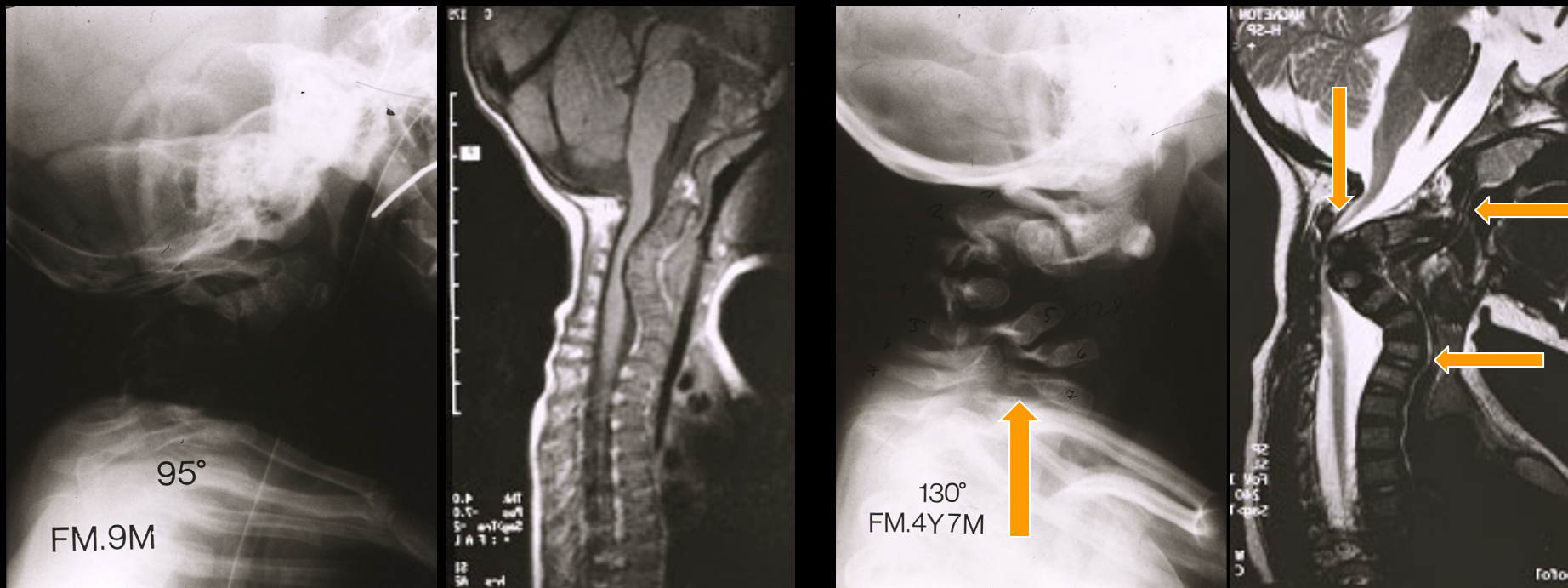
4Y 7Mo, Female



Larsen – Syndrome Kyphosis

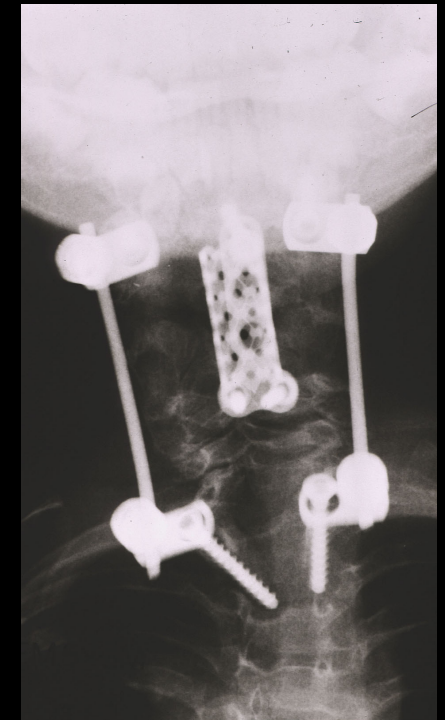
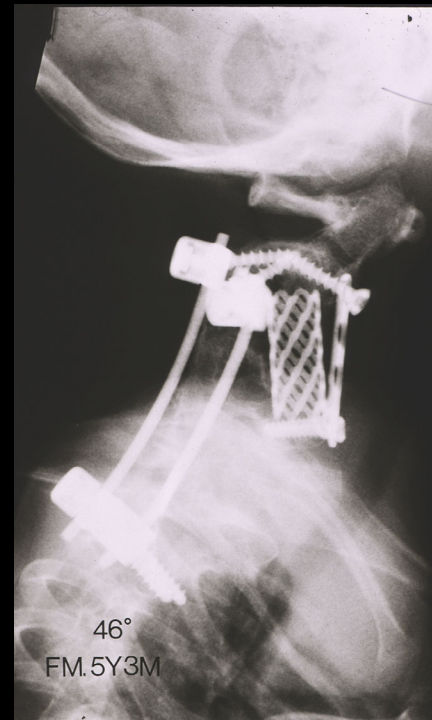
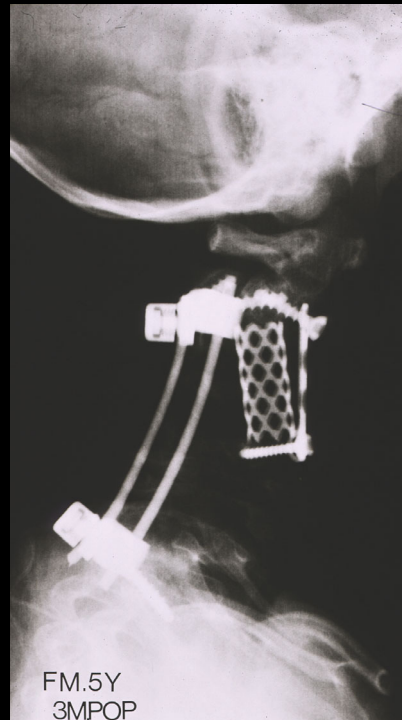
4Y 7Mo, Female

a lot of problems!



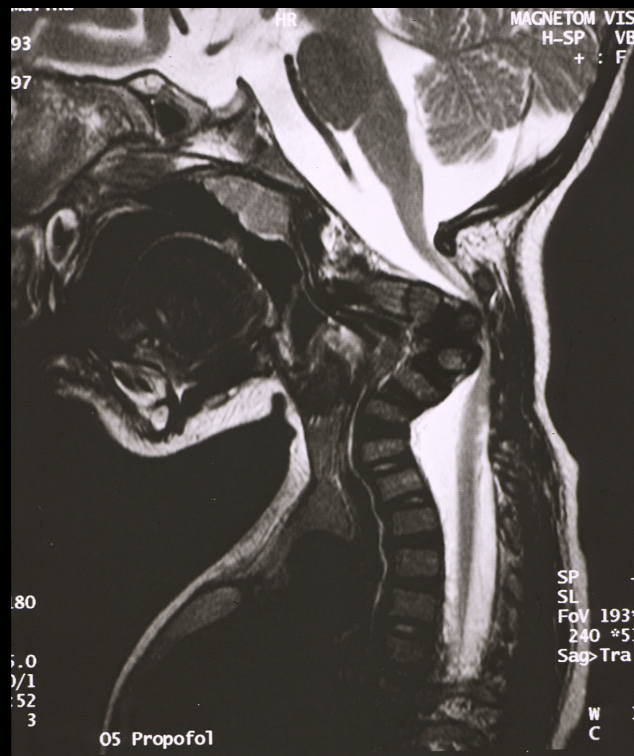
Larsen – Syndrome Kyphosis

4Y 7Mo, Female

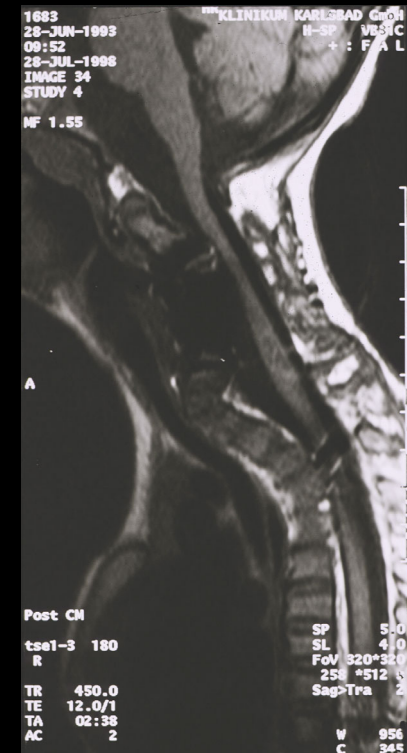
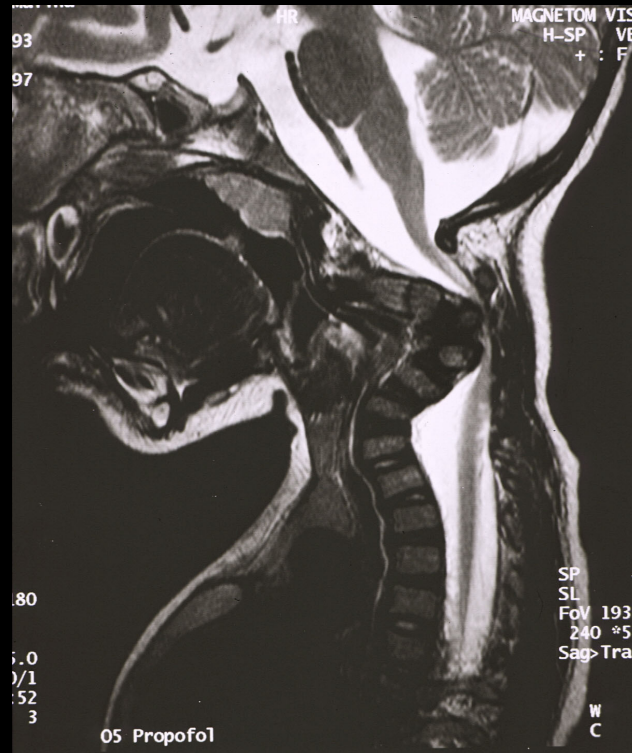


Larsen – Syndrome Kyphosis

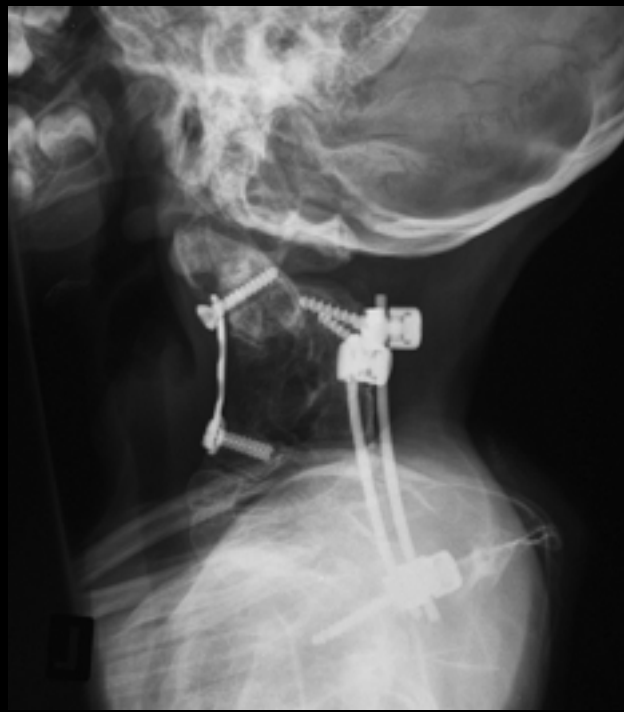
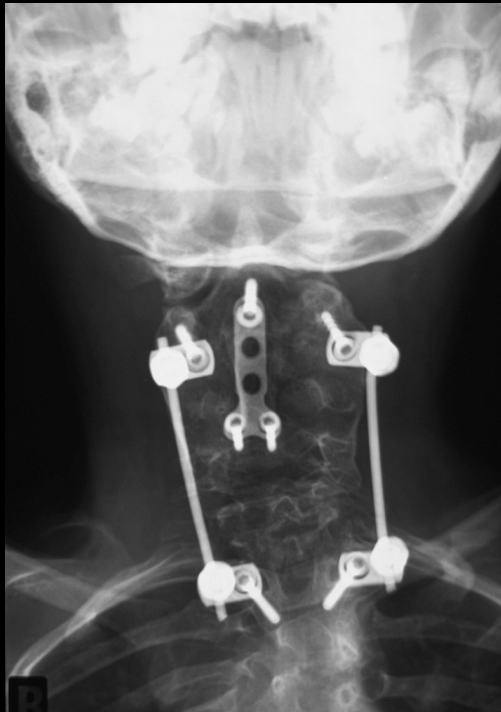
4Y 7Mo, Female



Larsen – Sy, HWS Kyphose 4J 7Mo, weiblich



Larsen – Syndrome Kyphosis 10Y, Female



- Konserv bone
- big problem the anchoring
- no bone material
- thinking about lordosis

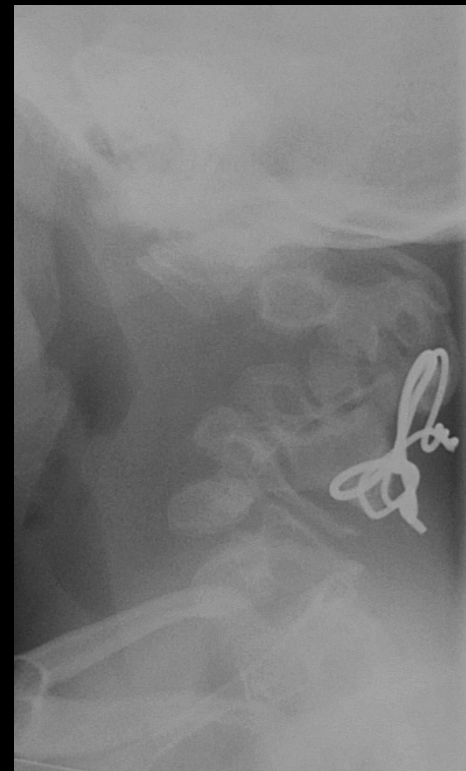
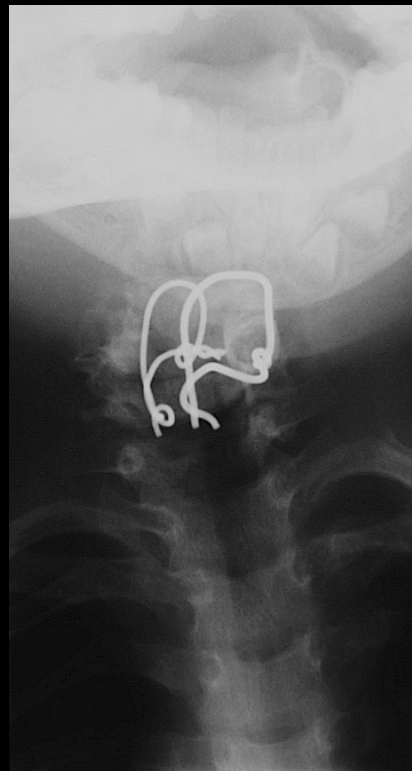
Case N° 2

Diastrophic Dysplasia, 4Y 8Mo, male

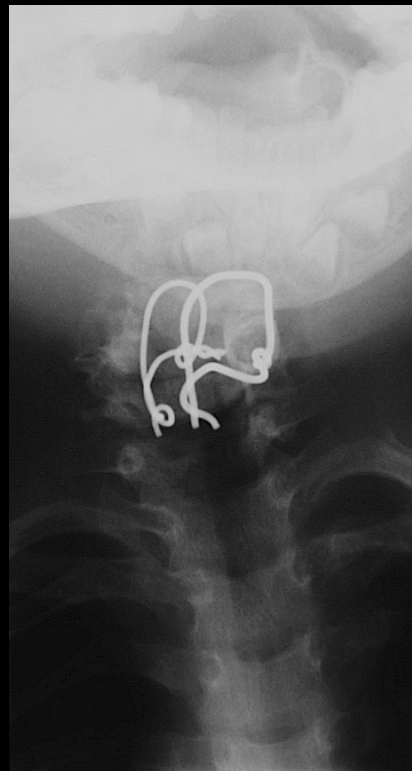
- after posterior Fusion C3-6,
- progression in kyphosis, severe tetraparesis,
- no posterior elements C1, C2, C3,
- C1, C2 arch open anteriorly



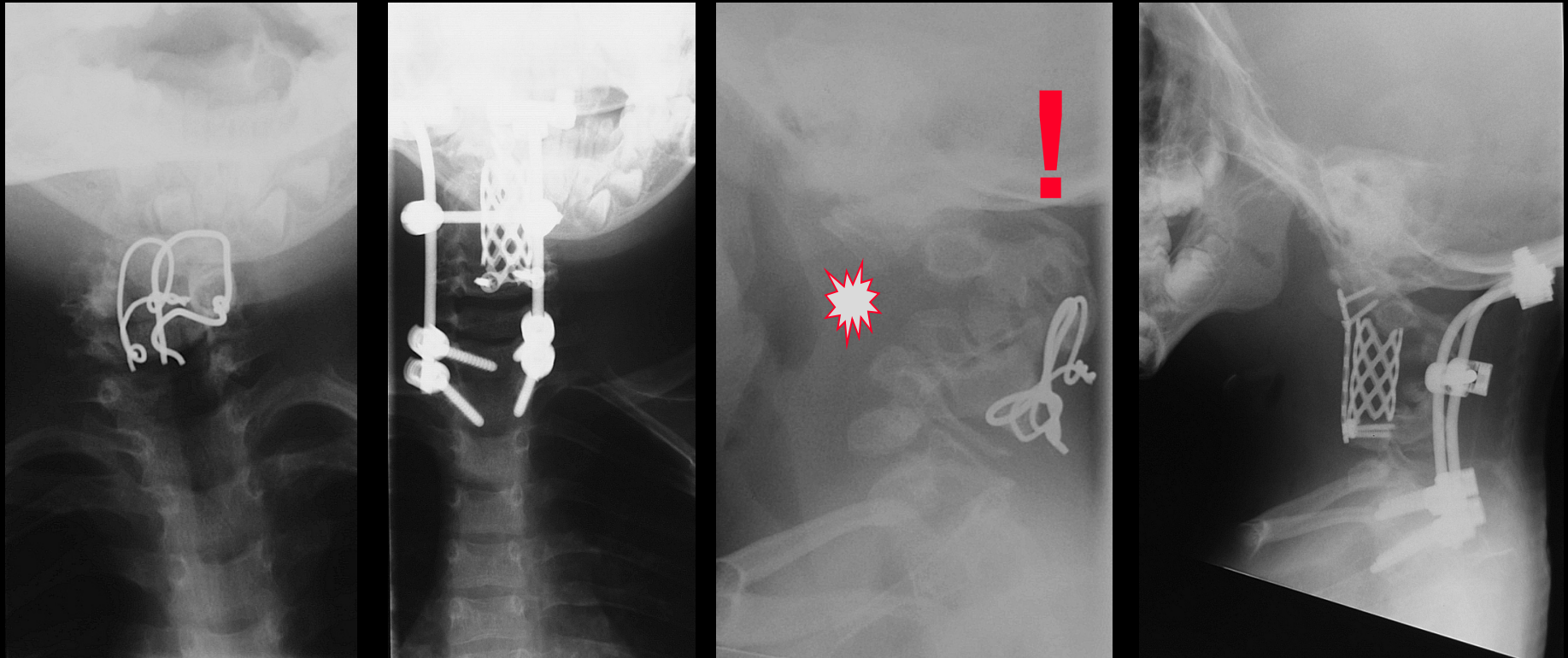
Diastrophic Dysplasia, 4Y 8Mo, male



Diastrophic Dysplasia, 4Y 8Mo, male

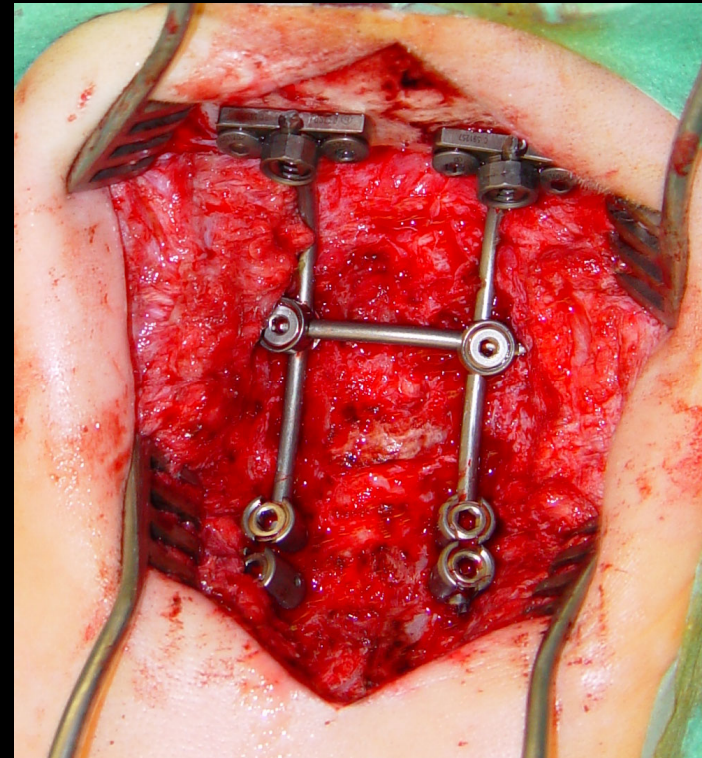
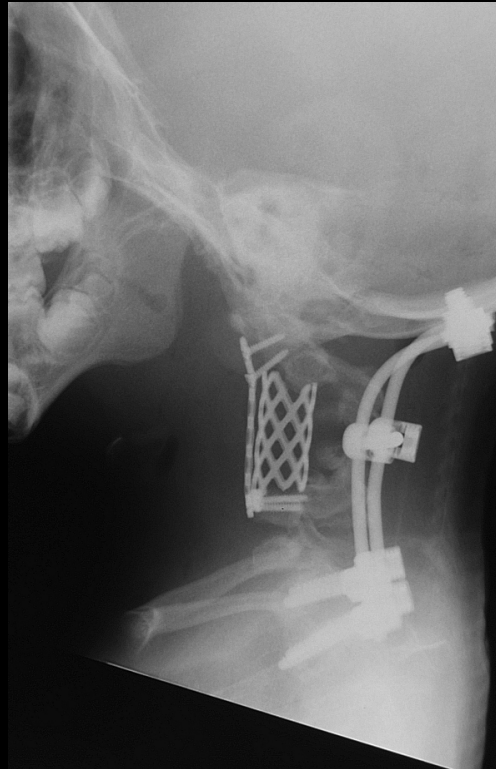
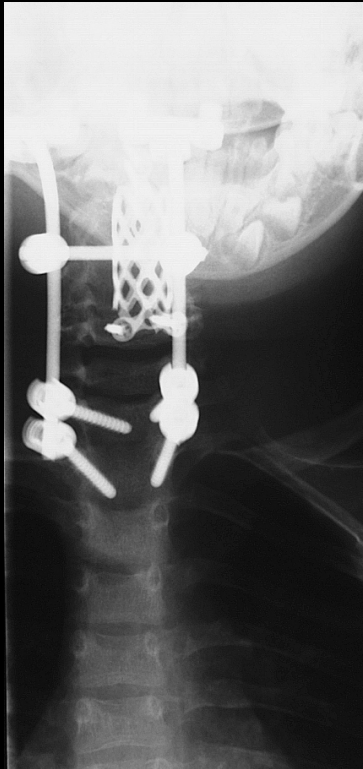


Diastrophic Dysplasia, 4Y 8Mo, male



Combined posterior-anterior-posterior surgery,
Anterior microscopically decompression through corporectomy C3,4,5
Anterior cage & plate C2-6, posterior stabilisation C0-T1

Diastrophic Dysplasia, 4Y 8Mo, male



Combined posterior-anterior-posterior surgery,
Anterior microscopically decompression through corporectomy C3,4,5
Anterior cage & plate C2-6, posterior stabilisation C0-T1

Results

- On average 78% correction of kyphosis was achieved
- Two cases demonstrated improvement of tetraparesis post-operatively.
- No postop wound infection or implant failures
- Correction in previously operated patients was more difficult to obtain.

Complications

- One case of nerve root neurapraxia with complete recovery at 6 months.
- Two dural tears
- One infant died 1 week postoperatively due to bolus aspiration.
- In one case kyphosis progressed below the instrumented levels.

Summary

- ⊙ In case of cervical kyphosis with neurological deficit in children, standalone posterior decompression and fusion is NOT recommended
- ⊙ Combined (posterior-)antero- posterior approach with correction of deformity and decompression is the method of choice

Summary

- ⊙ Correction of deformity also allows for normal growth of the unaffected spinal regions preventing development of secondary structural changes

Conclusion

- ⦿ surgery is warranted independent of the age and size of the patients
- ⦿ treatment should not be delayed
- ⦿ Do NOT operate from the back alone !
- ⦿ If you do it, frequent follow-ups are necessary during growth.
- ⦿ If progression of kyphosis is detected, do not hesitate! Perform surgery!
- ⦿ Do not forget biomechanics and biology (growth)



Thank You !