

Management Of early onset scoliosis by Proximal Fixation With 4rib Construct

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Current methods for management of early onset spinal deformity

- VEPTR
- Growing rods

There is now a substantial data base on what these methods can and cannot do

Both are effective in reliably elongating the spine with repeated lengthenings, but.....

Both methods have complications

- Growing rods
 - Implant failure, skin problems, premature spinal fusion
- VEPTR
 - Drift of rib attachment, skin problems, brachial plexopathy, ?chest wall scarring

“4 rib” method of rib fixation

Evolved over period of several years,
as an alternate method of fixation
to current methods

Consists of 2 downgoing laminar
hooks, usually on ribs 2 and 3, and
2 upgoing laminar hooks, usually on
ribs 4 and 5

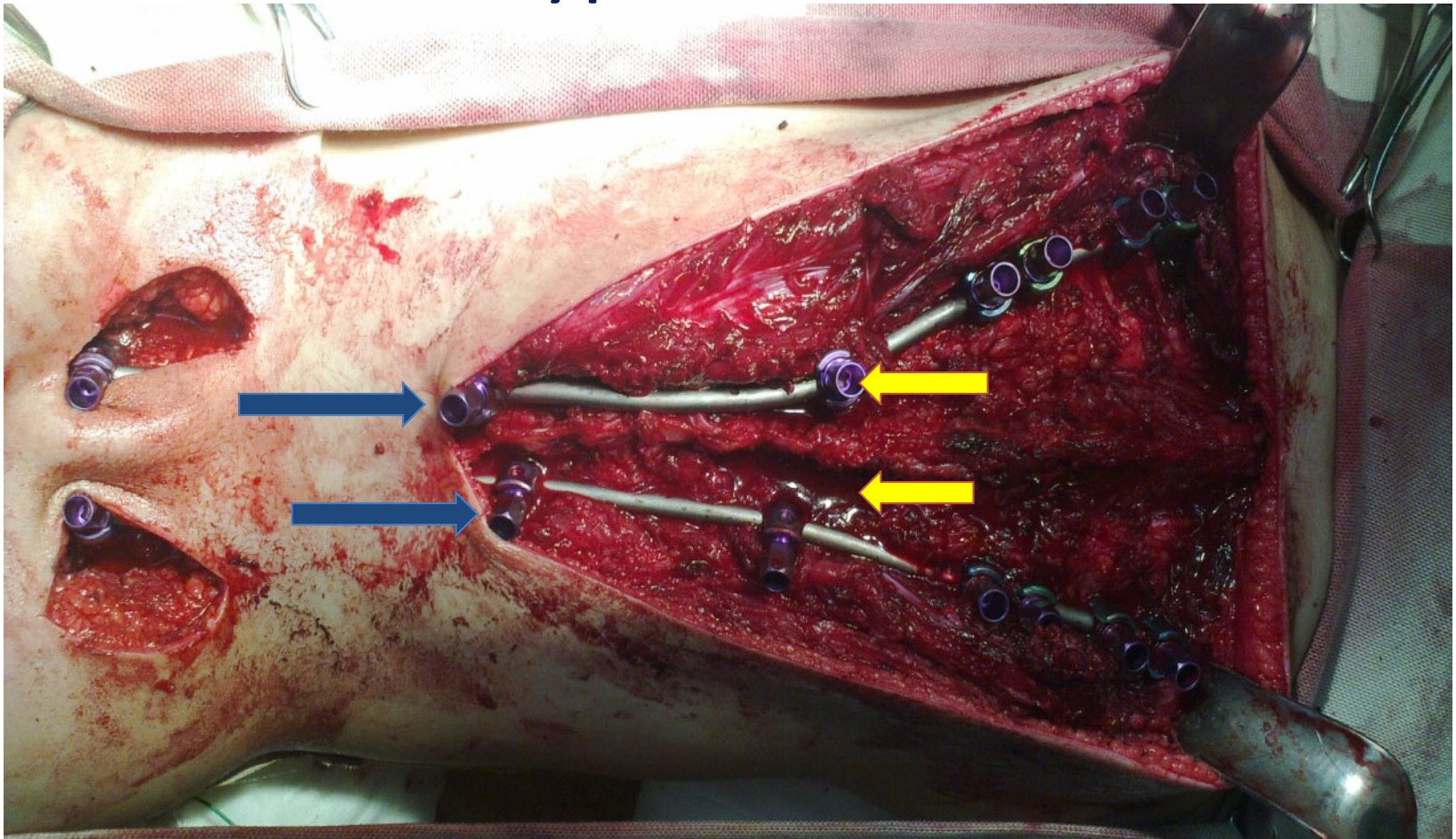
We now report our experience with 18
cases, 4 from Charleston, SC and 14
from Nablus, West Bank, Palestine

Retrospective, but ongoing review
with IRB approval from both
institutions



Number of patients	18	14-Palestine , 4- Charleston-USA
Type of early onset deformity	9 scoliosis 6 kyphoscoliosis 3 kyphosis	
Mean age at surgery	6.8 years	from 2.0-12.9 years
Mean followup time	28months	
Mean preoperative measures	scoliosis Thoracic kyphosis Thoracolumbar kyphosis	82 93 62

4 rib construct with pedicular screws proximal and distal to thoracolumbar kyphosis





Results

	Preoperative	Post opeartive
Mean thoracic kyphosis	93	62
Mean thoracolumbar kyphosis	62	26
Mean scoliosis	82	52

Complications

1 superior mesentric artery syndrome

2 delayed infection

1 dislodgment of proximal fixation

1 distal fixation dislodgment .

4 skin breakage

2 crouch gait

There were no neurological complications

We believe that the 4 rib construct technique has advantages in the early onset scoliosis specially when associate with kyphosis due to:

1. Easy application
2. Strong anchor proximally
3. Avoid kyphogenic effect during rod lengthening
4. Adjustment of the rod to control the apex
5. Long lever arm without fusion
6. No need for post operative brace with the dual rod

Recommendations

- Use the 4.5 rod system for small children
- Do always extraperiosteal dissection when exploring the spine
- Try to put the rib hooks as near as possible to the transverse process
- Moderate compression of the hooks for the clawing to avoid rib fusion in the future
- Depend mainly on the cantilever effect to correct kyphosis .
- Remove the cross link during the 1st lengthening process

Conclusion

- The 4 rib construct has been a safe and reliable method of proximal fixation for early onset deformity, and may be (?is) a superior method in the presence of kyphosis