
Peer Review File

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Review Comments

The authors present nice case of dual VCR for AS patient.

Well written and of interest:

Minor comments, but please address:

Comment 1: Report blood loss and fluid management of thus patients: The patient was ventilated 4 days after surgery#1, what was his positive balance those days.

Response 1: The following was added in the case description to clarify this question: “His net fluid balance on POD 1 was +750cc and POD 2 was -227cc, which most likely contributed to his fluid overload.”

Changes to text: Lines 148-149

Comment 2: The AS patients can be corrected only in the thoracic spine effectively when there is residual mobility at the sternocostal junction T4-T9 or when the 3CO is T1-T3 and T10-T12 with rib osteotomies (Koller et al ESJ 2018, Osteotomies in AS). Please address, as otherwise some colleagues will make mishaps.

Response 2: The following was added to the case description to clarify this question: “The plan for the T2 VCR coincides with the work done by Koller et al who showed that adequate thoracic spine correction in patients with AS is only possible when there is residual mobility at the sternocostal junctions at T4-9 or when the three column osteotomy is at T1-T3 and T10-T12 with rib osteotomies¹⁰.”

Changes to text: Lines 160-164

Comment 3: It is difficult to fully balance the head in rigid C2-S1 spine. The C2-C7 and C2-S1 offset can be effectively improved with powerful VCR, but the head til as on the x-rays and the clinical image remains and can Make the headache and dizziness. It would require a conter-osteotomy, but that's is extensive osteotomy C2-7. Please address the challenge balancing the head tilt versus the C2-C7 offset.

Response 3: There is certainly great challenge is balancing the head tilt and the C2-7 and C2-S1 offset. We addressed this by obtaining intraoperative full length spine AP and lateral x-ray after placing our rod to gauge the adequate balance and tilt of the patient. This is described in the case description as follows:

“All implant position was confirmed with intraoperative radiographs stitched to view the entire spine from the skull to the sacrum/pelvis for adequate coronal and sagittal global balance and the spinal cord data was stable throughout.”

Changes to text: Line 190

Comment 4: You used off-set connectors in the first surgery rather than hooks (N=2)

for multiple rod construct, please Address.

Response 4: This offset connector is the device the senior author prefers using to ensure there were 4 rods spanning the VCR level for increased stability of the construct. The following was added in the case description to answer this question:

“We used the off-set connectors on the main rods at the level of the VCR to add these additional rods in an efficient manner.”

Changes to text: Line 184-185

Comment 5: How was correction guided / tracked during 2nd surgery: Sliding rod, bending rod, wires, or just manual control . Who and how you lifted the head is of interest for surgeons doing that stuff as it is a difficult step, even more with VCR vs. SPO or PSO.

Response 5: The cervicothoracic deformity was partially corrected with patient positioning using the halo traction. The correction using the rod was done with manual control based on the senior author’s previous experience and expertise. The following was added to the case description to answer this question:

“We used the off-set connectors on the main rods at the level of the VCR to add these additional rods in an efficient manner. The cervicothoracic deformity correction was achieved with proper intraoperative head positioning using halo traction, as well as adequate rod contouring and positioning based on the senior author’s previous experience and expertise.”

Changes to text: Line 185-188

Comment 6: Did you use rod bending for sagittal correction or "only" multiple changes of the temporary rods.

Response 6: Rod bending was used for sagittal correction while the temporary rods were used to temporarily stabilize the spine. The following was added to the case description to address this question:

“After complete resection of the T2 vertebral body, we did multiple rounds of sequential convex compression and concave distraction after placing the final rods with appropriate sagittal bend to shorten and adequately align the spine”

Changes to text: Line 180

Comment 7: The cases emphasizes the benefit of construct-2-construct work and connection which can make surgery more efficient. You might stress that.

Response 7: Thank you for your comments. The following was added in the case description to answer this question:

“We used the off-set connectors on the main rods at the level of the VCR to add these additional rods in an efficient manner.”

Changes to text: Line 184-185

Comment 8: AS patients have high risk for TVT and pulmonary embolism. Report on your measures against this.

Response 8: Thank you for your comments. The following was added to the case description to answer this question:

“After both surgeries, the patient was given Enoxaprin 40mg once a day as an inpatient for deep vein thrombosis prophylaxis”

Changes to text: Line 193-194

Comment 9: Postoperative these kind of cases with long lsurgery time have often asymptomatic pancreatitis according to their lab tests. You encountered this after the first long surgery ??

Response 9: Thank you for your question. We have not obtained any amylase or lipase for this patient postoperatively, so we are not aware of this finding for this patient.

Comment 10: Please stress that one should have experience with N>100 single VCRs before doing such a ride...as revision of poor dual VCR case would be a big pain for another surgeons.

Response 10: Thank you for your comments and we fully agree. We added the following in the conclusion to answer your question:

“Prior to undertaking such an endeavor, the spine surgeon must be aware of his or her expertise with the surgical techniques involving the VCR.”

Changes to text: Line 205-206

Comment 11: Did you use bone graft or BMP in the case and if so did you lay it on the dura posteriorly and bridging the osteotomy site?

Response 11: We used BMP in the case, which was placed in the anterior column with the cage and bridging the osteotomy site. The following was added to the case description:

“Afterwards, an 18 x 18 mm large custom VCR cage, with autologous local bone and bone morphogenic protein (BMP)”

Changes to text: Line 139-140

Comment 12: Nice case, should be shared.

Response 12: We would like to thank this reviewer for critically assessing our manuscript and providing valuable feedback that strengthened and improved our manuscript.