



**ORIGINAL RESEARCH PAPER**

**Orthopaedics**

**MANAGEMENT OF ACUTE TRAUMATIC CERVICAL SPINE INJURY IN THIRD TRIMESTER PREGNANCY**

**KEY WORDS:** Cervical Spine, Third Trimester, Pregnancy, Management.

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**ABSTRACT**

**INTRODUCTION :** Cervical spine injuries are very rare in pregnancy. There have been only a few case reports. There is lack of literature regarding the management of cervical spine injury in pregnancy. There is a dilemma whether to operate cervical spine first or deliver the child first as both the methods have their own advantages and disadvantages. **CASE DETAILS:** A 21 year old primigravida presented with history of fall from height (10 feet) with flexion distraction injury of cervical spine with ASIA impairment scale grade A in her third trimester. MRI was done which was suggestive of Grade 2 anterolisthesis of C6 over C7 with facet dislocation. She was initially managed conservatively with Gardner's cervical skeletal traction tongs. A fetal USG was done which showed a single live viable fetus of 32 weeks gestation age. A live male child was delivered by Caeserean section two weeks after the injury. Anterior cervical decompression and fusion(ACDF) was done one week later with Anterior cervical plating(ACP) and iliac bone grafting. Patient was followed up regularly till 12 months. **CONCLUSION:** Managing cervical spine injury in third trimester poses diagnostic and therapeutic challenges. It requires a good multidisciplinary team work of obstetrician, neonatologist, anaesthetist and orthopaedician. We first managed the cervical spine injury conservatively, followed by delivery of the child, followed by surgical stabilization of cervical spine. We have achieved good maternal and fetal outcome.

**INTRODUCTION**

Cervical spine injuries are very rare in pregnancy. There have been only a few case reports (1) and hence the incidence has also not been calculated. There is lack of literature regarding the management of cervical spine injury in pregnancy. Pregnancy per se predisposes the patient to various conditions like deep venous thrombosis, urinary tract infections; whose risk is further increased with cervical spine injury. There is a dilemma whether to operate cervical spine first or deliver the child first as both the methods have their own advantages and disadvantages. We report one such case which was managed successfully with good maternal and fetal outcomes.

**CASE PRESENTATION**

A 21 year old 32 weeks primigravida from Nepal presented with history of fall from height of around 10 feet and sustained trauma to the cervical spine. She presented to us two days after the injury. After ensuring that her vitals are stable, Philadelphia collar was applied at the emergency department and detailed neurological evaluation was done. She was found to have paraplegia with power zero in both lower limbs, sensations were lost below umbilicus, bowel and bladder sensations were also lost which corresponded to ASIA impairment scale grade A. Foleys catheterization was done taking all aseptic precautions. Obstetrician consultation was done and fetal ultrasound was done which revealed a single live intrauterine gestation of 32 weeks with oligohydramnios. As she was 8 months primigravida, to avoid radiation exposure X ray was not done. Routine blood investigations were done. MRI cervical spine with screening of whole spine was done which was suggestive of grade 2 anterolisthesis (<50%) of C6 over C7 with facet dislocation. We used Allen Ferguson classification system to classify the cervical spine injury which was stage 2 flexion distraction type (dislocation).

She was started on Dexamethasone, protein supplements and Intravenous fluids. As the child was premature, decision was taken to initially manage the cervical spine injury conservatively. Gardner well cervical skeletal traction tongs were applied and cervical spine dislocation was reduced. Post reduction Cervical spine lateral X ray was taken after shielding her with lead gown and reduction was confirmed. She was daily observed by both orthopaedician and obstetrician. Daily FHS monitoring was done. Regular fetal ultrasounds were done to assess the fetal maturation and well being.



**Figure 1: MRI cervical spine sagittal views showing grade 2 anterolisthesis of C6 over C7**



**Figure 2: Application of Gardner well Cervical ray of cervical spine after applying cervical traction tongs**

Two weeks later, at 34 weeks of gestation, she was posted for emergency Caesarean section as there were signs of fetal distress. During the surgery, orthopaedician was available standby. A healthy live male child of 2.5 kgs birth weight, APGAR score 10 was born. As the child was premature, it was kept in NICU for observation. After the surgery, patient was optimized, haemoglobin was improved by blood transfusion. Repeat blood counts were done. One week later, she was posted for cervical spine surgery- Anterior cervical decompression and fusion (ACDF) by Anterior cervical plating (ACP) and iliac bone grafting. Intra operative period was uneventful. Philadelphia collar was applied to immobilize

the cervical spine post surgery. Post operative physiotherapy exercises were started as tolerated.

**Table 1: Time frame of events**

TIME FRAME OF EVENTS	
Within 72 hours of injury	Admission to tertiary care centre
Within 6 hours of admission	Vitals stabilized, MRI done, cervical skeletal traction applied and listhesis reduced
Next 48 hours	Inj Dexamethasone 6 mg IM 12 hourly 4 doses
2 weeks since injury	Emergency Caeserean section, healthy live male child of birth weight 2.5 kg delivered
1 week later (3 weeks since injury)	Surgical stabilization of cervical spine by Anterior cervical decompression and fusion
POD 2	Starting of Physiotherapy exercises as tolerated
2 weeks follow up	Suture removal done, physiotherapy exercises continued
8 weeks follow up	Toe touch weight bearing, continued physiotherapy
10 weeks follow up	Partial weight bearing mobilization
3 months follow up	Full weight bearing mobilization with support
12 months follow up	Full weight bearing mobilization without any support, able to perform most of the activities of daily living



**Figure 4: Post operative X ray cervical spine Anteroposterior and lateral view showing well reduced cervical spine with Anterior cervical plate**

**RESULTS**

Intravenous antibiotics and Methyl prednisolone were administered. Passive range of motion exercises were started. Her neurological status started to improve after the surgery. On post operative day 1 her lower limb power was 2/5. IV antibiotics were continued for a period of 5 days and she was discharged on post operative day 5 on Philadelphia collar. Check dress was done and was healthy and hence was called for follow up after 10 days. Suture removal was done on post operative day 15 on follow up and physiotherapy was continued. Partial weight bearing was started at 10 weeks. Full weight bearing started at 3 months. By 1 year, she was able to do almost all her activities of daily living.

**Table 2: Results**

Results Parameters	72 hours post injury	At 12 months follow up
American Spinal Injury Association Motor Score (AMS) (0-100)	8	94

Spinal Cord Independence Measure (SCIM) (0-100)	14	93
Functional Independence Measure (FIM) (18- 126)	18	118
Walking Index for Spinal Cord Injury (WINSICI II) (level 0- 20)	0 level	19 level

**DISCUSSION**

Many of the previous case reports on spinal cord affection in pregnancy have been reported but most of them are non traumatic conditions like Potts spine, hemangioma, etc. There have been very few reports regarding traumatic spinal cord injury in pregnancy and the number decreases still more in case of cervical spine injury. Reddy et al in 2018 reported such a case in which first they did surgical stabilization of cervical spine first followed by elective LSCS at maturity as per the dictum. In our case patient and relatives were involved in decision making and were given two choices : (I) continuation of pregnancy till maturity, elective LSCS followed by surgical stabilization of cervical spine or (ii) Early surgical stabilization of cervical spine followed by continuation of pregnancy till maturity and elective LSCS. The pros and cons of both the methods were explained to the patient and patient chose the first option. In the first option the advantages were no risk of radiation to the fetus, no risk of premature delivery and disadvantage was prolonged bed rest.

To prevent the risks of deep venous thrombosis, intermittent pneumatic compression devices were used and passive range of motion was started. As indwelling Foley's catheter was used, to decrease the chances of urinary tract infection, bladder wash and tab Nitrofurantoin was started. Chest physiotherapy (Incentive spirometry) was started to decrease chest infections.



**Figure 5: patient walking full weight bearing with the help of walker at 6 months post op.**

**CONCLUSION**

Acute traumatic cervical spine injury in pregnancy (third trimester in our case) poses diagnostic and therapeutic challenges. It requires a good multidisciplinary approach and team work to manage such cases and our team included an

orthopaedician, obstetrician, anaesthetist and neonatologist. Despite the dictum, we first did delivery of the child and later followed by surgical stabilization of the mother. We have achieved good maternal and fetal outcomes.

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