



Jain Institute of Spine-care And Research

A unit of

Bhagwan Mahaveer Jain Hospital



JISAR NEWS

QUARTERLY NEWSLETTER AND SPINE-CARE UPDATE

Cervical Pedicle screw fixation – Transforming surgical approach in cervical spine surgery – PART-II

The Technique of Cervical pedicle screw insertion has been a challenging issue due to the proximity of the cervical spinal cord and the vertebral artery on either side of the narrow cervical pedicles. However few Orthopaedic spine surgeons in Japan, Korea and China started describing the technique of cervical pedicle screw insertion and have been using them routinely without much complication. Till date cervical pedicle screws have not been used in most of the western countries.

As spine surgery is getting evolved as a leading orthopaedic speciality, newer techniques are being tried and evolved in India also. At present very few centers in India are practicing this method. We at Jain Institute of Spine-care And Research have been using cervical pedicle screws for various disorders of cervical spine and have performed more than 20 surgeries using cervical pedicle screws.

In continuation of the series of Trauma patients presented in the last news letter, we present few cases of cervical Myelopathy treated with decompression and pedicle screw-rod instrumentation at our Institute, showing its advantages.

We are also glad to inform you that a new technique for the insertion of cervical pedicle screws has been developed at our institute. The technique has been accepted by the North American Spine Society (NASS) as an original technique and is being presented at the NASS annual meeting in October-2012.



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Why do we need to use Cervical pedicle screws?

- The cervical pedicle screw fixation gives a significantly superior strength of fixation as compared to the lateral mass screws. It is the only device that provides fixation into all the three columns of the cervical spine.
- Cervical pedicle screws have transformed the surgical approach in patients requiring multilevel cervical decompressions, cervical Kyphosis with Myelopathy and in unstable 3 column fracture dislocations of cervical spine.
- All these patients usually require a combined anterior and posterior cervical instrumentation for proper stabilization of the cervical spine.
- With the advent of cervical pedicle screws all of these patients can be managed with a single stage posterior approach with decompression and rigid stabilization of all the 3 columns of spine.

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CASE-1

He was a 65 year old male with cervical Myelopathy with inability to walk since 2 weeks, with spasticity in both lower limbs. Patient also developed urinary retention for one week and was on catheter.

His imaging showed marked cervical Kyphosis and degenerative canal stenosis with cord signal changes from C4 to C6. He required decompression of the cervical canal from C3 to C6 with simultaneous correction of his cervical Kyphosis. The deformity cannot be corrected with posteror approach only using lateral mass screw fixation. Therefore, the patient needed to undergo an anterior decompression and deformity correction along with posterior instrumentation with lateral mass screws for three column stabilization of the cervical spine.

However with the use of cervical pedicle screws, we could achieve 3 column fixation of the cervical spine with deformity correction. Laminectomy from C3 to C6

with Kyphosis correction ensured complete decompression of the cord and rigid stabilization. The patient did well postoperatively without requirement of ICU care and started to recover neurologically in 2-3 weeks. At present patient is able to walk with walker and has regained his bladder and bowel control.

The use of cervical pedicle screws in this patient prevented the additional extensive anterior surgery and decreased the morbidity to a great extent, which reflected in the uneventful recovery postoperatively.

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Fig 1: A 65 year old male with cervical Kyphosis and cord signal changes from C4 to C6. Postoperative images showing laminectomy from C3 to C6 with Kyphosis correction using cervical pedicle screws.

Case-2

Case 2: He was a 43 year old male with progressively increasing difficulty in walking with spasticity of both lower limbs since 6 weeks. His imaging also showed marked cervical Kyphosis with Myelopathy. The patient had been advised anterior and posterior surgery by most of the surgeons he had met. We proposed a posterior only surgery with cervical pedicle screw-rod construct for simultaneous Kyphosis correction and decompression.

The postoperative and intraoperative images show the decompression achieved with C3 to C6 laminectomy and Kyphosis correction with cervical pedicle screw fixation. The patient recovered well and could walk without support at 2 weeks postoperatively.

The patient developed right sided C5 root palsy postoperatively, with complete loss of elbow flexion. C5 palsy after posterior decompression in cervical spine is a well known entity due to the short course of C5 root. The incidence of C5 palsy with Laminectomy decompression is about 4-6% but increases to 11-12% with Kyphosis correction. On CT scan there were no screw perforations impinging on any roots or dura. As reported in literature, the C5 palsy recovered in 8-10 weeks postoperatively with good elbow flexion.

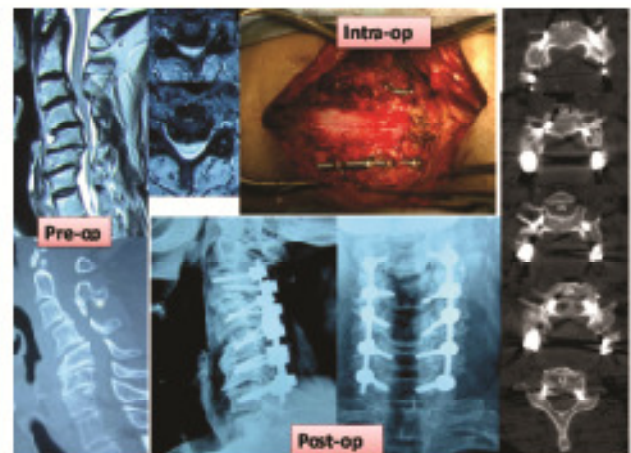


Fig 2: 43 year old male with cervical Kyphosis and Myelopathy. The postoperative and intraoperative images showing C3 to C6 laminectomy and Kyphosis correction with cervical pedicle screw fixation.

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Case-3

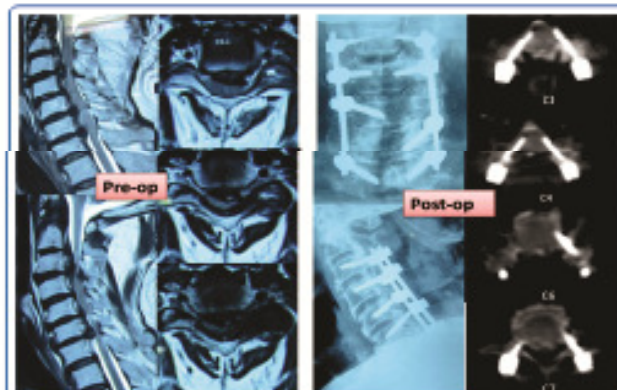


Fig 3: C3-C7 cervical stenosis with OPLL and Myelopathy. Postoperative X-rays and CT scans show laminectomy from C3 to C6 with Pedicle screw rod instrumentation.

Case 3: A 65 year old man presented with weakness in all 4 limbs and was bedridden since 3 months. His MRI showed ossified posterior longitudinal ligament (OPLL) from C3-C7 with myelopathy. The patient underwent Laminectomy from C3 to C6 with Pedicle screw rod instrumentation by posterior approach alone. Patient showed partial improvement (6 weeks postoperatively) in power of lower limbs with intact bowel and bladder functions. Presently he is under follow-up with physiotherapy.

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Case-4

Case 4: He was a 51 year old man with gradually increasing difficulty in walking with spasticity and imbalance since 3 months. His MRI showed mild cervical kyphosis with thecal compression maximal at C3-4 level. We went ahead with posterior only approach with Laminectomy and Kyphosis correction using cervical pedicle screws. Post-operatively the patient had improvement in his gait and the X-rays show good restoration of cervical lordosis.

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Fig 4: Moderate Cervical kyphosis with Myelopathy operated with Laminectomy from C3 to C5 with Pedicle screw rod instrumentation (note the restoration of cervical lordosis).

Case-4

She was a 75-year old lady with progressive stiffness in the legs and inability to walk since 2 weeks with urinary retention since 1 week. Her MRI showed calcified ligamentum with severe compression at C3-4 and C4-5 levels. She underwent C3,C4 laminectomy with pedicle screw rod instrumentation from C3 to C5. The lady showed early improvement in her neurology and was able to walk without support within 2 weeks postoperatively. She also regained her bladder functions in 2 weeks.

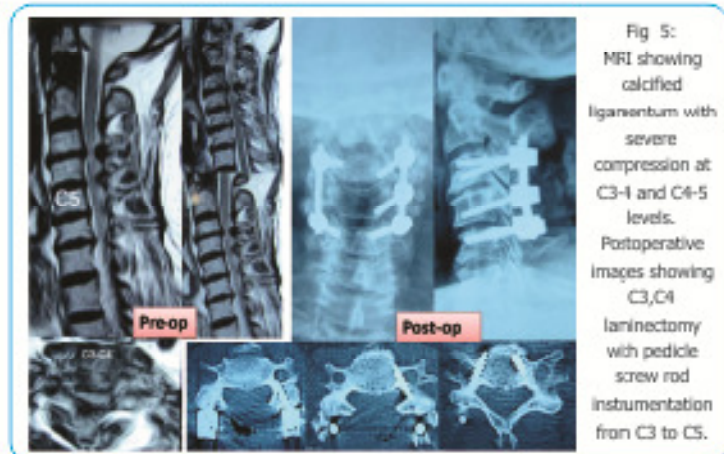


Fig 5: MRI showing calcified ligamentum with severe compression at C3-4 and C4-5 levels. Postoperative images showing C3,C4 laminectomy with pedicle screw rod instrumentation from C3 to C5.

Tips and Pearls

- Cervical pedicle screws have transformed the surgical approach in patients with cervical spine pathology.
- Most of the cervical spine pathologies can be addressed by a single posterior approach with the use of cervical pedicle screws.
- Cervical pedicle screws can be used safely in the fixation of cervical spine with proper training and meticulous technique.
- Cervical pedicle screws are still not used in the west but are routinely used in major orthopaedic centers of Japan, china and Korea. Only few centres in India are using cervical pedicle screws at present.



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