



OUTCOME ANALYSIS OF TRANSFACETAL FIXATION WITH DECOMPRESSION IN THE MANAGEMENT OF CERVICAL SPONDYLOTIC MYELOPATHY

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ABSTRACT **Background:** Posterior cervical spine fixation for subaxial spine is one of stabilising procedure for various cervical spine pathologies. Modern fusion techniques like lateral mass screws(LMS), transfacetal screws(TFS), pedicle and interlaminar screw proved to be safe, inexpensive, better biomechanical stability and neurological outcome. Transfacetal screw is an evolving technique due to its safety, ease of doing, less expensive with a better or equivalent biomechanical stability. **Aim:** Outcome of transfacetal screw and decompressive laminectomy in cervical spondylotic myelopathy by comparing with lateral mass screw. **Methodology:** This study was conducted with 20 patients, operated for cervical spondylotic myelopathy. They were grouped in to group 1 and group II. Group I (10 patients) operated with transfacetal screw and decompression and group II(10 patients)operated with lateral mass screw fixation. The neurological outcomes were analyzed with NURICK and mJOA. Other parameters like duration of surgery, blood loss, no: of fluoroscopic shots, post op pain and length of hospital stay were also compared. **Results:** Group I, neurological improvement is 90 % and in group II, it is 80%. On follow up after 3 months, both group showed a recovery rate to 90 %. Patients improving to \leq grade 3 and mild disability in group I is 70% and other side it is 60%. When comparing other parameters, group I showed a better results when compared to group II. **Conclusion:** Transfacetal fixation is simple, safer, inexpensive technique. It is better than lateral mass fixation in reducing the duration of surgery, blood loss, pain, exposure to radiation with early discharge. Transfacetal fixation is a 4 cortical purchase screw, hence chances of screw pull out strength is more

KEYWORDS : Transfacetal screw, lateral mass screw, NURICK, mJOA

INTRODUCTION:

Posterior cervical spine fixation for subaxial spine is one of stabilising procedure for various cervical spine pathologies due to trauma, inflammatory, neoplastic and degenerative disorder (1). In the past many techniques were used like insitu fusion with autogenous bone graft and wiring technique. In the present era there utilization is very limited for selected cases due to high incidence of psuedoarthrosis and prolonged immobilisation (2). Modern fusion techniques are aiming at easy and safe techniques, minimal hospital stay, early return to work with minimal loss of range of movements, good biomechanical stability and better neurological outcome. The present day posterior instrumentation techniques like lateral mass screws(LMS), transfacetal screws(TFS), pedicle and interlaminar screw proves to have better construct and good neurological outcome. Lateral mass is a common freehand screw technique for subaxial spine. Transfacetal screw on other hand is a evolving technique due to its safety, ease of doing, less expensive with a better or equivalent biomechanical stability

AIMS AND OBJECTIVES:

Analyzing the outcome of transfacetal screw fixation with decompressive laminectomy in cervical spondylotic myelopathy by comparing with lateral mass screw fixation.

MATERIALS AND METHODS:

Study setting:

Department of Neurosurgery, Thanjavur Medical College, Thanjavur.

Study period: 1st Jan 2021 – 30th Jan 2023.

Design: Retrospective descriptive study.

Sample size- 20

Data collection: Data was collected from the patient records using a standardized structured questionnaire 10 patient operated for cervical decompression with transfacetal screw fixation compared(group I) with 10 patients operated with cervical decompression and lateral mass fixation(group II). They were assessed with preoperative and post operative functional outcome with modified Japanese orthopedics association scale and Nurick's functional grading. Other intra – post operative parameters like duration of surgery, blood loss, no: of fluoroscopic shots, pain and length of hospital stay are also compared

- Inclusion criteria: Patient operated for cervical spondylotic myelopathy - More than 3 level involvement, K line positive,

posterior element involvement

- Exclusion criteria: Traumatic listhesis of cervical spine, less than 3 level involved, scoliosis

Operative procedure:

Patient in prone position after ETGA. Head in neutral position placed on horse shoe / Mayfield. Mildline incision extending frominion to C7. Layers dissected to expose till the lateral border of lateral mass. Upto this step similar for both the group

Group I: Prof N Muthukumar technique of transfacetal screw insertion(3):The entry point 2 mm above the middle of the lateral mass without any lateral angulation. The facet is curetted and is drilled then till all the four cortical surfaces are purchased. Followed by tapping and screw insertion.

Group II: Magrel et al technique used for lateral mass fixation(4): 1 mm medial and cranial to the center of the lateral mass with 20–30° lateral angulations. Followed by decompression at the corresponding level. Crushed bone harvested from spinous process is then implanted at the facet region for fusion

RESULTS :

Figure 1 (Group I outcome)

NURICK's	Pre op	Post op (POD 5)	Follow up (After 3 months)
Grade 0	0	-	-
Grade I	0	-	-
Grade II	0	-	-
Grade III	0	3	6
Grade IV	4	4	3
Grade V	4	3	1
Grade VI	2	-	-

Figure 2 (Group II outcome)

NURICK's	Pre op	Post op (POD 5)	Follow up (After 3 months)
Grade 0	0	-	-
Grade I	0	-	-
Grade II	0	-	-
Grade III	0	2	3
Grade IV	5	4	4
Grade V	3	2	3
Grade VI	2	2	

Figure 3 (Group I outcome)

mJOA	Pre op	Post op (POD 5)	Follow up (After 3 months)
15 to 18	0	2	5
12 to 14	3	8	5
0 to 11	7	0	0

Figure 4 (Group II outcome)

mJOA	Pre op	Post op (POD 5)	Follow up (After 3 months)
15 to 18	0	4	4
12 to 14	3	5	4
0 to 11	7	2	2

Figure 5 (Group I & II Neurological outcome)

Types of screw fixation	% of neurological improvement (POD 5)	% of neurological improvement (after 3 months)
Transfacetel screw (Group I)	90 %	90%
Lateral mass screw fixation(Group II)	80%	90%

Figure 6 (Other criteria)

Criteria		Group I	Group II
Time (mins)	Range	80-120	115-175
	Mean ± SD	89 ± 13.7	131.5 ± 17.4
Average blood loss(ml)	Range	210-350	340-550
	Mean ± SD	272 ± 43.7	430 ± 68.24
Fluoroscopic shots (no:)	Range	12 -16	15-32
	Mean ± SD	13.9 ± 1.6	17.1 ± 2.61
Post op 1 (pain score)	Range	3-4	6-8
	Mean ± SD	3.3 ± .67	7.1 ± .88
Hospital stay (days)	Range	7-9	12-14
	Mean ± SD	7.6 ± 843	12.7 ± 1.16

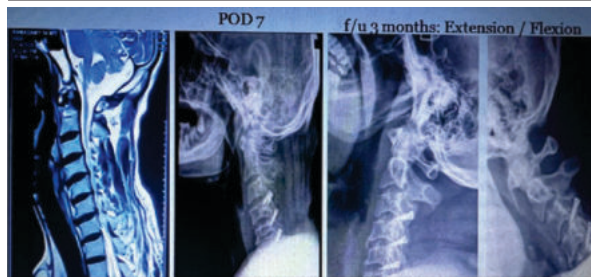


Figure 7 (Pre-op, POD 7, Follow up after 3 months)

The outcome of (group 1)transfacet screw is analysed and was compared with the (group II)lateral mass screw fixation. They were assessed with Nurick's and mJOA scoring preoperatively, POD5 and follow up (3 months).Along with neurological outcome, other variables like duration of surgery, average blood loss, no: of fluoroscopic shots, post operative pain, length of hospital stay were also compared. On POD 7 group I, neurological improvement is 90 % and in group II, it is 80%. On follow up after 3 months, both group showed a recovery rate to 90 %. Patients improving to ≤ grade 3 and mild disability in group I is 70% and other side it is 60%. 10 % of patients in both group that showed no recovery belongs to higher grade of myelopathy. Group I and group II showed similar post operative neurological outcome. When comparing intra – post op variables, group I showed a better results when compared to group II

DISCUSSION:

Transfacetel screw fixation is one of the evolving technique used for subaxial spine fixation. It is a free hand technique with less implant profile. It is less invasive and simple alternative to lateral mass screw fixation(4). It has no rod fixation hence wound healing is better with minimal restriction of flexion- extension and rotation. Since it is 4 cortical purchase its biomechanical stability is superior to lateral mass fixation(5). Neurological outcome is almost similar in long term follow up. Vertebral artery and nerve root is safe from injury as they are anterior to the articular pillar. Cervical kyphosis and facet fracture are the contraindications of transfacetel screw fixation. Pre operative evaluation with dynamic X rays to be considered to rule out the same. In a study done on cadavers by J W Klekamp (6) on screw pullout strength, concluded a greater screw pullout strength for transfacetel

screw when compared to lateral mass screw. One of the disadvantages of this technique is that it need more cranial exposure than lateral mass to align the instrument (7).

CONCLUSION:

Both transfacetel screws (Group I) and Lateral mass screw (Group II) fixation provides a better and similar neurological outcome. Transfacetel fixation is simple, safer, inexpensive technique. It is better than lateral mass fixation in reducing the duration of surgery, blood loss, pain , exposure to radiation with early discharge. Transfacetel fixation is a 4 cortical purchase screw, hence chances of screw pull out is less (3). Flexion extension constraints is low in transfacetel screw when compared to lateral mass screw (8). Implant profile is low in transfacetel hence it reduces the neurovascular injury (9).

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