Titanium Miniplates Use: A Simple and Effective Method of Preventing Bone Graft Dislodgment in Anterior Cervical Discectomy and Fusion

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Disc degeneration is part of natural aging process and may be accelerated by long term repetitive trauma or a single episode of more severe injury. Deterioration in protein polysaccharide gel of the nucleus leads to alteration in the way, the nucleus distributes pressure loads. This alters the mechanics of the annulus; which undergoes fibration and weakness and so allows the nucleus to herniate or protrude. The degree of herniation ranges from mild bulging through a torn annulus to overt herniation through the posterior longitudinal ligament with sequestration of nuclear material in the spinal canal or in a neural foramen. The next surgical decision is whether to include a fusion. Some surgeons do not fuse, citing results similar to those series in which fusion was performed. Non fusion prevents the small risk of complications such as graft extrusions, absorption, nonunion and donor site problems. However a combination of discectomy and fusion is recommended because spinal angulations, collapse of the disc space with further nerve root compression and increased postoperative and interscapular pain may occur if a fusion is not performed and these risks outweigh those associated with fusion.

Dislodgment of the bone graft that has been incorporated into the adjacent vertebrae is a frequent problem in anterior cervical discectomy and fusion (ACDF) and has never been satisfactorily resolved to date. This may cause neck pain, absorption of the graft, cervical kyphosis, and in extreme cases, esophageal or pharyngeal perforation, or spinal cord compression. In this study, we tried to assess the efficacy of anterior cervical miniplates in preventing the dislodgement of bone graft.

This retrospective study was conducted at Walsgrave Hospital, UK to study the efficacy of Titanium miniplates in preventing the anterior dislodgment of bone graft after the anterior cervical discectomy. The study included 163 patients who underwent this procedure between 1994-1999. Information's were taken from theatre register, patient notes and X-rays. Position of bone graft was assessed by reviewing immediate postoperative lateral cervical spine X-ray and repeat X-rays in out patient clinic 3 months later. Minimum follow up was for 3 months. Postoperative complications were from patient's notes.

During this time period, 163 patients (85 males and 78 females) underwent ACDF with miniplates. The mean age was 52 years (range 22-83). The increase in operation time for holding the bone graft with anterior cervical miniplates, ranged from 5 to 8 minutes. Minimum follow up was for 3 months. There was only 1 case of graft dislodgment (0.61%) due to technical error in positioning of the plate. There were 3 cases (1.84%) of plate fracture with 1 patient needing reoperation to remove the plate and 1 case of plate fracture with superficial skin infecting. There was one case of incidental screw fracture in the vertebral body, which did not require removal. This gave a complication rate of 3.07% (Table-1)

<table>
<thead>
<tr>
<th>Complications</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plate Fracture</td>
<td>03 (1.84%)</td>
</tr>
<tr>
<td>Screw Fracture</td>
<td>01 (0.61%)</td>
</tr>
<tr>
<td>Graft dislodgment</td>
<td>01 (0.61%)</td>
</tr>
<tr>
<td>Total</td>
<td>05 (3.07%)</td>
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</tbody>
</table>

Table 1

Dislodgment of bone graft after anterior cervical discectomy and fusion is a very distressing problem both for the patients and the surgeon. Schmidek HJ, reported an incidence of 2-8% in his study. In our study the incidence of graft dislodgement was only 0.61%. Although miniplates added 10 minutes to the total duration of surgical procedure however on the other hand it is also associated with a low complication rate of 3.07%. Therefore considering the expenses of reoperation and distress to the patient due to bone graft dislodgement, the routine use of miniplates is economical and rewarding for the patients and surgeon. This study also points out the need of conducting a proper double blind, randomized, prospective study.
REFERENCES


