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Cochrane Nursing Care Field – Cochrane Review Summary

Prepared for the

Orthopaedic Nursing Journal

Effectiveness of posterior decompression techniques compared with conventional laminectomy for lumbar stenosis (Review)

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- **Background:**

Lumbar stenosis is defined as narrowing of the spaces within the lumbar region of the spine, including the spinal canal, lateral recess and neural foramina. This causes compression of the spinal nerves and associated symptoms range from numbness and fatigue to pain in the buttocks, thighs and legs. Degeneration associated with ageing is the typical cause of lumbar stenosis, and degenerative lumbar stenosis is the most common reason for lumbar surgery in people aged 65 years of age (Overvest et al, 2015).

The current gold standard surgical treatment for this condition is a facet-preserving laminectomy. This involves a midline lumbar incision and extensive resection of the posterior bone, posterior ligaments and muscular structures in the area. The risks associated with this technique include increased postoperative pain; perioperative blood loss; complications, for example iatrogenic infection; increased length of hospital stay; weakness secondary to muscle denervation and surgically induced spinal instability (Overvest et al, 2015).

There is a lack of consensus about the specific amount of bony decompression required to effectively decompress the spinal canal. Posterior decompression techniques that limit the extent of bony decompression while preserving spinal integrity and minimising tissue damage have been proposed as an alternate to the conventional laminectomy. However while short term benefits have been proposed the long term efficacy of these techniques compared with standard facet-preserving laminectomy remains unclear (Overvest et al, 2015).

- **Objective/s:**

This review aimed to determine the effectiveness of techniques that limit the extent of bony decompression or avoid removal of posterior midline structures of the lumbar spine compared to conventional facet-reserving laminectomy for the treatment of patients with degenerative lumbar stenosis.

- **Intervention/Methods:**

The review included all types of prospective, controlled studies, including randomised controlled trials (RCTs) and cohort studies that compared the conventional approach of a facet-preserving laminectomy to an intervention of limited bony decompression or posterior midline structure-preserving technique. Three types of surgical interventions were included: unilateral laminectomy, bilateral laminectomy and split-spinous process laminectomy.

The primary outcome measures considered in this review were:

- Functional disability
- Perceived recovery
- Leg pain.

The secondary outcomes assessed included length of hospital stay, the incidence of complications, surgically induced spinal instability, paraspinal muscle degeneration/atrophy, muscle cell injury (creatinine kinase level), walking distance, back pain, length of surgical procedure, perioperative blood loss, and postoperative use of analgesics.

- **Results:**

Ten studies, representing a total sample size of 733 participants aged between 57 and 72 years of age were included in this review. All included studies were RCTs, however two of the studies were reported to use inadequate randomisation methods and four studies used unclear randomisation methods. Four of the studies were assessed by the authors to be at low risk of bias.

No significant difference in disability scores, used to assess functional disability, was reported between the intervention and control groups. There was no significant difference in self-perceived recovery between participants who received a unilateral laminotomy with the control group. A significant difference was reported in participants who underwent a bilateral laminotomy however the supporting evidence was of low quality. The authors found no evidence that any technique of posterior decompression resulted in a significant reduction in leg pain.

All studies included in the review demonstrated a decrease in postoperative spinal instability following decompression with preservation of the posterior midline structures compared to conventional laminectomy. The markers of tissue damage, the incidence of postoperative instability and postoperative back pain were significantly reduced when treatment groups were compared. However the authors state that these results should be viewed with caution as the studies included in the review were generally of poor methodological quality and included small study populations. The authors found no significant differences in the incidence of perioperative complications, length of surgical procedure and postoperative walking distance.

- **Conclusions:**

For the three primary outcome measures the authors concluded that posterior decompression techniques that preserve the posterior midline structures were equally as effective as the conventional laminectomy. The authors note that while the proposed advantages of the interventions, regarding the incidence of iatrogenic instability and postoperative back pain were plausible, the ability to make definitive conclusions was limited by the poor methodology and poor reporting of outcome measures in the included studies. Overall the individual studies included in this review were not of sufficient power to assess all specified outcome measures, therefore further research is necessary to establish whether these techniques offer a safe and effective alternate to conventional laminectomy.

- **Implications for Practice:**

The risks associated with the conventional laminectomy point to the need for evidence-based alternatives such as those considered in this review. Researchers need to ensure that their studies are sufficiently powered and that they maintain high standards of methodological rigour in order to facilitate changes in practice through the dissemination of high quality evidence based recommendations.

References:

Overdevest G., Vleggeert-Lankamp C., Jacobs W., Thomé C., Gunzburg R., Peul W. 2015. Effectiveness of posterior decompression techniques compared with conventional laminectomy for lumbar stenosis. (Review). *Cochrane Database of Systematic Reviews*, 2015, Issue 3, Art.No: CD0009515 DOI: 10.1002/14651858.CD0009515.pub2.