

Benefit of dorsal laminectomy without lumbosacral stabilization in lumbosacral traumatic cat

Piyabongkarn Damrongdej

Linthong Veterinary Clinic, 172 Ramkhamhaeng Road Minburi district Bangkok, 10510, Thailand

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Correspondence author

Piyabongkarn Damrongdej

Phone: (66)814061396

E-mail: damrongdej10510@gmail.com

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Abstract

Two cats were diagnosed with depression of caudal equina spinal nerve and lumbosacral spinal trauma that revealed rapid improving clinical signs after 1 month of dorsal laminectomy at the region of lumbar and sacral vertebrae without internal and external stabilization devices. This report showed that dorsal laminectomy was a powerful procedure for decompression caudal equina spinal injuries in stable lumbosacral vertebral trauma in cats without ancillary fixation methods.

Dorsal laminectomy is valuable technique for correction of fracture/luxation of vertebrae that this procedure can reduce spinal cord edema, and axonal disruption. Stabilization of vertebrae by the orthopedic implants may be not necessary in small cat that has enough vertebral stability as the same in two these cases.

Key words: cat, laminectomy, caudal equina, lumbosacral, trauma.

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1. Introduction

Lumbosacral spinal injuries are the common cause that can find in vehicular accident in most cat (Scott & McLaughlin, 2007). Injury in lumbosacral vertebral bone can lead to sciatic nerve, pelvic nerve, and pudendal nerve damages (Zulauf et al., 2008; Meeson & Corr, 2011). Common clinical signs in cat affected by lumbosacral injuries that are pelvic limbs ataxia, pelvic limbs paralysis, urinary incontinent signs, tail paralysis, and difficulty for defecation (Janssens et al., 2009; Danielski et al., 2013). These clinical signs occur from lumbosacral spinal cord and caudal equina nerve root injuries. The damages of cranial nerve root caudal equina (L6-S1) will cause paraparesis with lower motor neuron (LMN) signs because sciatic nerve injuries. Injuries of sacral nerve root (S1-S3) that is origin of pelvic and pudendal nerve may cause urinary retention, loss of anal tone and urethral sphincter tone, and loss of perineal sensation (Scott, & McLaughlin, 2007). Dorsal laminectomy is the decompression surgery for the correction of lumbosacral

spinal damages that can induces excellent outcome if the rapid correction of surgery is performed after the vehicular accident. Stabilization using plate, pin, wire, and pedicle screw are necessary after laminectomy surgery but the cost of these implant also is the problems for many owners so this report showed the excellent outcome for alone dorsal laminectomy surgery without implant stabilization.

2. Materials and methods

Case 1. Three months old cat (1.5 kg) had received accident by a car for one day duration. He could not stand, and both pelvic limbs loss of deep pain sensation. No proprioceptive of both hind limbs. The concave back had observed in the lumbosacral region (Fig 1). The myelography showed filling defect of contrast medium (Omiplaque) L6, and L7 area (Fig 2). The plain radiography showed right dorsolateral hip joint luxation (Fig 3). A cat was anesthetized by Tiletamine-Zolazepam (Zoletil 100), then maintained anesthesia by 3% isoflurane. Dorsal laminectomy was performed

by bone rongeur. The dorsal spinous process and vertebral lamina of partial L6, total L7, and total S1 vertebrae were removed, then fat graft was placed on the laminectomy area (Fig 4). After finishing laminectomy, the right femoral head was removed from the hip joint (femoral head resection) (Fig 5). Amoxicillin plus clavulanic acid, and tofenamic acid were injected intramuscular for four days consecutively.



Figure 1. A concave back of a kitten (case 1)



Figure 2. The myelography showed filling defect of contrast medium (Omiplaque) L6, and L7 area (case 1)



Figure 3. Radiography showed right dorsolateral hip joint luxation (case 1)



Figure 4. Dorsal laminectomy L6, L7, and S1 (case 1)

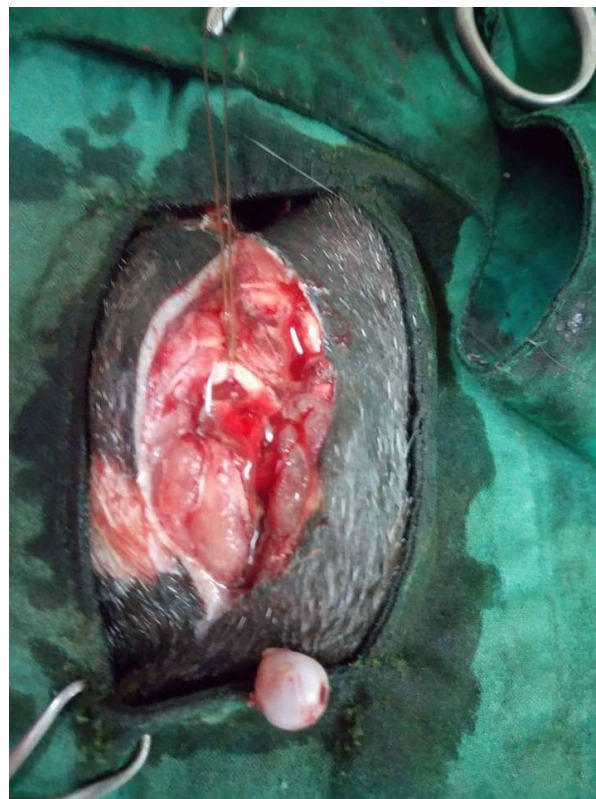


Figure 5. Femoral head resection (case 1)

Case 2. Ten years old cat (3.5 kg) had accident by car 30 days ago. He showed both pelvic limbs ataxia, and urinary continent signs. The radiography revealed fracture, and luxation of S3, and Cd1 (Fig 6). Dorsal laminectomy was performed by removing S1-S3 of sacrum lamina, and tail removing at the first caudal vertebrae (Fig 7). Amoxicillin plus clavulanic acid, and tofenamic acid were injected intramuscular for four days consecutively.



Figure 6. Radiography revealed fracture/luxation of S3 and Cd1 (case 2)



Figure 7. Dorsal laminectomy of S1-S3 (case 2)

3. Results and discussion

In case 1, a cat can run in good posture after 60 days of surgery and good in urination control as the same in case 2 a cat can walk in good posture, and urinary incontinent problems that are reduced after 20 days of surgery. Both clients satisfy outcome after surgery. In these cases, cats were performed dorsal laminectomy in the lumbosacral vertebrae region in individual case problem without internal and external fixation device. The first case, a cat had lower in weight, and he was a kitten that promote rapid healing process. The second case, a cat showed pelvic limbs ataxia, and urinary incontinent that occurred from sciatic nerve, pelvic nerve, and pudendal nerve damages after decompression surgery 20 days, a cat showed improve clinical signs. Although both cats are not stabilized surgery after dorsal laminectomy but the pelvic limbs, and urinary incontinent signs are better than before dorsal laminectomy significantly. The most report showed significantly improve after stabilization

by pins and/or screws, and PMMA for fracture/luxation vertebrae such as retrospective study in 2008 by Bruce C.W. et al that showed vertebral stabilization by surgery could lead improve clinical signs more than conservative treatment (Bruce et al., 2008). In 2018, Karabulut E. studied retrospective method that 11 cats were diagnosed with spinal fracture or luxation that had been good results with wire, and PMMA for spinal vertebrae stabilization without decompression surgery (Karabulut, 2018). May be in this study, cats had minor spinal cord compression so that spinal vertebrae stabilization was not necessary in these cases. Two cats after decompression caudal equina surgery had improved in urinary incontinent signs after 2 months of surgery because pelvic and pudendal nerve root were released from sacral lamina compression. First case, a cat can sit and walked after 3 days of surgery because cauda equina spinal nerve root were released from compression of lamina vertebrae rapidly (surgery after 1 day from vehicular accident). The rapidly correction of surgery after accident can reduce vascular damage, cord edema, and axonal disruption (Mckee, 2016). Second case, cat had received the vehicular accident in a long-time (more than 30 days) so that healing process must be longer than first case.

4. Conclusions

Dorsal laminectomy is valuable technique for correction of fracture/luxation of vertebrae that this procedure can reduce spinal cord edema, and axonal disruption. Stabilization of vertebrae by the orthopedic implants may be not necessary in small cat that has enough vertebral stability as the same in two these cases.

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