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PATIENT SURVIVAL AFTER ANTERIOR APPROACH FOR CERVICAL CORRECTION AND STABILIZATION IN LOWER CERVICAL TRAUMA (FACET JOINT DISLOCATION): REPORT IN 2 CASES

KELANGSUNGAN HIDUP PASIEN SETELAH OPERASI STABILISASI DAN KOREKSI SERVIKAL *VIA ANTERIOR APPROACH* PADA TRAUMA SERVIKAL BAWAH (DISLOKASI SENDI FASET): LAPORAN 2 KASUS

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ABSTRAK

Dislokasi fecet cervical pasca trauma terjadi sekitar 6.7% dari cedera cervical spine. Dislokasi facet adalah bagian dari cedera cervical tipe fleksi atau distraksi. Cedera fleksi distraksi digambarkan sebagai pergeseran ke anterior dari korpus vertebra akibat tarikan atau pergeseran dari elemen posterior disertai dengan dislokasi atau fraktur faset. Sudah diketahui bahwa dislokasi faset akan merobek kompleks ligamen posterior dan kapsul faset dan memerlukan operasi stabilisasi sebagai terapi definitif. Ada banyak metode untuk stabilisasi dislokasi cervical. Kami melaporkan 2 pasien, keduanya didiagnosa dengan bilateral facet joint dislocation dari VC5-6 yang kami lakukan operasi anterior cervical discectomy dan fusion (ACDF) dengan hasil 5 bulan pasca operasi, pasien masih bertahan hidup dengan kondisi neurologis yang sama seperti sebelum operasi saat pasien datang ke rumah sakit. Keuntungan dari ACDF adalah durasi operasi yang pendek, nyeri paska operasi yang ringan sampai sedang, perdarahan yang sedikit, dan memberikan rasa nyaman untuk anestesi karena posisi opeerasi terlentang dengan pernapasan pasien yang abdominal.

Kata Kunci: *Dislokasi Faset Servikal,Dislokasi Sendi Faset Bilateral, Anterior Cervical Discectomy Fusion*

ABSTRACT

Traumatic cervical facet dislocations represent 6.7% of substantial cervical spine injuries. Facet dislocations are part of a spectrum of cervical spine flexion / distraction - type injuries. Flexion distraction injuries are described as anterior displacement of the vertebral body due to tensile or shear failure of the posterior elements coupled with facet fractures or dislocations. It is agreed that bilateral facet dislocations (DF3) disrupt the posterior ligamentous complex and facet capsule and require operative stabilization as the definitive treatment. There are some methods to stabilized the dislocated cervical. We report 2 patient, both patients diagnosed with bilateral facet joint dislocation of VC5-6 that we perform ***a****nterior cervical discectomy and fusion (ACDF) with result 5 months follow up, patient survive with neurologist condition same as patient come to hospital. The benefit of ACDF is short length of surgery, mild to moderate postoperative pain, minimal bleeding, and make easy for anesthesia due to supine position with abdominal respiration.*

Key Words: *Cervical Facet Dislocation, Bilateral Facet Joint Dislocation, Anterior Cervical Discectomy Fusion.*

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INTRODUCTION

About two thirds of cervical spine injuries occur within the subaxial cervical spine, with fractures occurring most often at C6 and C7 and dislocations occurring most commonly between C5-C6 and C6-C7 (Zhang *et al.,* 2016). Traumatic cervical facet dislocations represent 6.7% of substantial cervical spine injuries. Facet dislocations are part of a spectrum of cervical spine flexion / distraction-type injuries. Flexion distraction injuries are described as anterior displacement of the vertebral body due to tensile or shear failure of the posterior elements coupled with facet fractures or dislocations. Bilateral facet dislocations disrupt the posterior ligamentous complex and facet capsule and require operative stabilization as the definitive treatment (Anissipour *et al.,* 2017).

Unilateral and bilateral facet dislocations are quite common in the setting of subaxial cervical trauma. Considering the neurological status in unilateral facet dislocations, 25% of the patients are neurologically intact, 37% have radicular deficits, 22% have incomplete deficits and about 15% are tetraplegic. Bilateral facet dislocation is associated with significant soft tissue damage and a higher incidence of neurological deficits compared with unilateral facet dislocation. These lesions are highly unstable and early reduction is recommended to decompress the spine and improve neurological outcomes (Lins, 2016).

Surgical treatment of subaxial cervical spine injuries is important for restoration and protection of the spinal cord and nerve roots, reestablishing cervical alignment and also to restore spinal stability (Di Capua *et al*,, 2017). Cervical facet joint dislocation is generally managed surgically. The Subaxial Injury Classification System and Severity Score (SLICS) suggests that a unilateral or bilateral facet dislocation must be managed surgically, even in the absence of SCI (Joaquim *et al.*, 2013)

In addition to the timing of surgical treatment, the best approach (anterior, posterior, and combined) is another critical decision point. As a general rule, the approach is chosen based on the needs of cervical decompression, reconstruction, and stabilization (Nemani and Kim, 2014). Anterior approaches can maintain or restore cervical lordosis and also may cause less postoperative pain than posterior cervical surgeries (Level of Evidence: III). Anterior approaches have the advantages of supine position, less surgical trauma, and direct anterior decompression of neural elements, such as a disk

herniation or an anterior located bone fragment (Joaquim *et al.*, 2013).

We report two cases of bilateral facet joint cervical dislocation treated with Anterior cervical discectomy and fusion (ACDF).

CASE REPORT

CASE 1

A 49 year old male with no previous medical history sustained a fall from 3 meters height with his back hit the ground first. Patient complaint to feel pain on his neck and can not move his upper and lower limbs. After the accident patient brought to the near hospital and get medicine and x ray examination, after one day take care the patient was referred to Soeharso othopaedic hospital Surakarta. In the physical examination in emergency patient is fully concious with vital sign BP 90/54, pulse 78 bpm, RR 20 bpm and Temperature 36.8º C. The local examination from cervical region is, skin intact no lession appear, swelling over the cervical midline, midline tenderness with no step off and there is neurological defisit with motorik of the C5C6C7C8T1 is 32211 (R) / 32211 (L), L2L3L4L5S1 is 00000 (R) / 00000 (L), hypoesthesi at the level dermatom vertebrae cervical 5 and anesthesi at the level dermatom vertebrae thoracal 10, there is positive bulbocavernosus reflek of the patient with no sacral sparring. The cervical X-ray showed malalignment anterior longitudinal line C5-6, no discontinuity of the bone with intact endplate, retropharingeal space C5 14 mm, C6 22 mm, C7 20 mm (Figs. 1).

Figure 1. Cervical X ray Showed malalignment anterior longitudinal line C5-6, no discontinuity of the bone with intact endplate, retropharingeal space C5 14 mm, C6 22 mm, C7 20 mm.

MRI examination, showed oedem at corpus VC5 and VC6 with dislocation VC5 to VC6 for 25%, and suspect rupture of posterior longitudinale ligament and tear of annulus fibrosus that cause oedem of medule spinale segment VC4 until Th1 and soft tissue at its posterior (Figs 1.B). The patient diagnosed with bilateral facet joint dislocation cervical 5-6 frankel A and operated with anterior approach of ACDF. After the 2 month after care operation the

patient discharge and now still followed for 4 months now.

Figure 2. MRI showed oedem at corpus VC5 and VC6 with dislocation VC5 to VC6 for 25%, and suspect rupture of posterior longitudinale ligament and tear of annulus fibrosus that cause oedem of medule spinale segment VC4 until Th1 and soft tissue at its posterior

CASE 2

A 62 year old male with no previous medical history sustained a sliped down and head hit the pylon. Patient complaint to feel pain on his neck and can not move his upper and lower limbs. After the accident patient brought to the near hospital and then referred to Soeharso othopaedic hospital Surakarta 8 hours after the incident. In the physical examination in emergency patient is fully concious with vital sign BP 108/71, pulse 72 bpm, RR 22 bpm and Temperature 36.9^{o} C. The local examination from cervical region is, skin intact no lession appear, swelling over the cervical midline, midline tenderness with no step off and there is neurological defisit with motoric of the C5C6C7C8T1 is 31111 (R) / 31111 (L), L2L3L4L5S1 is 00000 (R) / 00000 (L), anesthesi at the level dermatom vertebrae cervical 5 to caudal, there is positive bulbocavernosus reflek of the patient with no sacral sparring. The cervical X-ray showed malalignment anterior longitudinal line C5-6 with translasi 4 mm (20%), no discontinuity of the bone with intact endplate, retropharingeal space C5 18 mm, C6 30 mm (Figs. 3).

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Figure 3. cervical X-ray showed malalignment anterior longitudinal line C5-6 with translasi 4 mm (20%), no discontinuity of the bone with intact endplate, retropharingeal space C5 18 mm, C6 30 mm

MRI examination, showed in Figs 4. The patient diagnosed with unilateral facet joint dislocation cervical 5-6 frankel A and operated with anterior approach of ACDF. After the 2

month after care operation the patient discharge and now still followed for 3 months now.

Figure 4. MRI cervical of the 2nd patient.

DISCUSSION

Injuries to the spine are common worldwide; in the United States, more than 50.000 spinal fractures occur yearly with 75% of those injuries occurring in the cervical spine. Approximately 20% of these fractures are accompanied by spinal cord injury. Because of the potential for tremendous morbidity and even mortality, prompt diagnosis and appropriate management of an unstable cervical spine injury is critical (Nemani and Kim, 2014).

About 200, 000 people currently live with spinal cord injuries in the United. More than 50% of these involve the cervical spine, and half of these present with unilateral or bilateral subluxations. The vast majority of these cases are treated within a week, either by traction, open reduction, or both (Barrenechea, 2014).

Bilateral facet dislocation is a hyperflexion-distraction injury associated with complete spinal cord injury in 65-87% cases, incomplete injury in 13-25% and less than 10% are intact. In our case, we found both of them are complete spinal injury. Anatomically the inferior articular processes of the upper vertebra moves forward over the superior articular facets of the lower vertebra because of severe hyperflexion. Adjacent fractures of the vertebral body, facet, lamina, pedicle, or transverse or spinous process have been found in 38.5%-60% of patients. In our cases we didn't found any fracture of vertebrae body, facet, lamina, pedicle, or transverse or spinous process (Sahoo *et al.,* 2011).

C5-6 and C6-7 are the most common involved segments. We see in our case both are dislocation at C5-6. A combination of lower height, smaller anteroposterior diameter of the superior facet, and a more horizontally oriented superior facet at C6 and C7 levels in vivo may

explain the predilection of translation relative to one another in the lower cervical spine (Sahoo *et al*., 2011).

The goal of treatment is reduction and stabilization for maximum neurological recovery as this injury is inherently unstable with both bony and ligamentous injury and disruption of spinal columns. The need of MRI before reduction is debated since 1990s. It is generally recommended that a prereduction MRI is prudent to get an understanding of the status of the spinal cord and any potentially offending soft tissue or bony structures placing the spinal cord at risk. In our cases MRI was done in both patients prior to reduction (Sahoo *et al.*, 2011).

Facet dislocations can often be reduced by closed means using tongs and traction, especially in an awake, cooperative, and neurologically intact patient. Pre-reduction MRI should be obtained in the situation of an intubated and anesthetized patient to evaluate the degree of cord compression and the possibility of disc fragments impinging on the cord. After reduction, definitive stabilization and fusion is required using either posterior or anterior instrumented techniques (Nemani and Kim, 2014). In our cases, we perform closed reduction using gardnel well tong to reduced the translation before perform definitive treatment with anterior cervical discectomy and fusion.

Figure 5. post operative of 1st case

Figure 6. Post operative of 2nd case

In most series only limited root function recovery is seen with no improvement below the level of injury. Overall improvement in ASIA score was seen in 37% cases. In our cases, both patient had neurological function post operation same as before operation. Even until 5 month follow up after operation, neurological function

still same as before operation held. Overall mortality was 37% with all cases having complete spinal injury (ASIA A). The most common denominator was ventilator dependence and associated pulmonary complications (Sahoo *et al.*, 2011).

Anterior approaches have the advantages of supine position, minor surgical trauma, and direct anterior decompression of the neural elements, removing ventral compressive structures such as disk and bone (Joaquim *et al.,* 2013). In our cases, we perform anterior approach with duration of surgery about 60 minutes with less bleeding compare to posterior approach.

CONCLUSION

Two patients with bilateral facet joint dislocation of C5-6 that had perform Anterior cervical discectomy and fusion. After the operation patient had same neurologic function as before operation, until 5 month follow up. Anterior approaches have the advantages of supine position, minor surgical trauma, and direct anterior decompression of the neural elements, removing ventral compressive structures such as disk and bone.

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