

# Cervical Myelopathy as the Most Common Symptoms in Patients Undergoing C-Spine Surgery in the Spine Division, Department of Neurosurgery, Cipto Mangunkusumo General Hospital, from January 2012 to December 2016



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## ABSTRACT

**Background:** Cervical spine disease has the potential to reduce productivity in affected patients because of myelopathy and mood disorder (e.g. depression) which lead to decreasing of the patient's quality of life.

**Objective:** This study aims to elaborate the most frequent symptoms and pathology of C-spine disease in patients who underwent a surgical procedure over the period time from January 2012 to December 2016.

**Method:** This study is a retrospective, conducted in Spine Division of Department of Neurosurgery, Faculty of Medicine, Universitas Indonesia (FMUI). All patients who underwent surgery for the C-spine disease are included. The data was obtained from the records in our spine database.

**Result:** The total number of surgical procedures for spine disease over the 5 years was 345 procedures, with 127 procedures in the C-spine

which are the second most common procedures of spine surgery in Department of Neurosurgery FMUI. The C-spine diseases were more common in males, aged more than 50 years old. The most frequent disease or pathology is degenerative disease, and yet, tumour cases show an increasing number and became the most common pathology in the year of 2016. The most common procedure is anterior cervical discectomy and fusion (ACDF).

**Conclusion:** Our study showed that the most common symptoms and pathology are myelopathies and degenerative disease respectively, which has similarity with another study in the term of the most frequent pathology and surgical procedure. The finding of the more advanced neurological condition by the time of surgery as the most common symptom is found to be contradictory with other studies in western countries.

**Keyword:** C-spine disease, c-spine surgery, myelopathy, cervical myelopathy

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## INTRODUCTION

Disease in the cervical spine (C-spine) is the most common cause of spinal cord impairment worldwide.<sup>1</sup> In severe conditions, such as cervical myelopathy, the patient's quality of life is reduced due to the limitation of mobility which is often accompanied by depression.<sup>2</sup> The introduction of the magnetic resonance imaging (MRI) scanning lead to a better management of the cervical spine problems,<sup>3</sup> as well as the introduction of the National Health Insurance (BPJS kesehatan), lead to increase the number of patients.<sup>4</sup> Since Cipto Mangunkusumo General Hospital is the top national referral hospital in Indonesia, this study aims to elaborate the most frequent symptoms and pathology of C-spine disease who underwent surgical procedures from January 2012 to December 2016.

## METHODS

This retrospective study was conducted in the Spine Division of Department of Neurosurgery, Faculty of Medicine, Universitas Indonesia (FMUI). All patients who underwent surgery for the C-spine disease are included. The data consisting of age, sex, disease, clinical presentation, and surgical procedures performed were obtained from the records in our spine database. Surgical indications are established on the basis of a history of disease and findings of neurological examinations suggesting the presence of radiculopathy and/or myelopathy, and confirmed by MRI examination in the presence of any nerve roots and/or spinal cord compression of any pathology, or in the presence of history of significant C-spine trauma accompanied by a sign or risk of spinal instability.

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## RESULTS

The total number of surgical procedures for the spine disease over the 5 year period was 345 procedures, with 127 procedures in the C-spine, 69 procedures in the thoracic spine (T-spine), and 149 procedures in the lumbar spine (L-spine). C-spine procedures are the second most common procedures of spine surgery in Department of Neurosurgery FMUI.

The C-spine diseases were more common in males, aged more than 50 years old. The most

frequent disease or pathology is degenerative disease, followed by tumour (Table 1). However, tumour cases show an increasing number and became the most common pathology in 2016 (Figure 1). Anterior and posterior approaches were equal in that period. The most common procedure is anterior cervical discectomy and fusion (ACDF), followed by laminectomy, laminectomy with fusion, and anterior cervical corpectomy and fusion ACCF respectively.

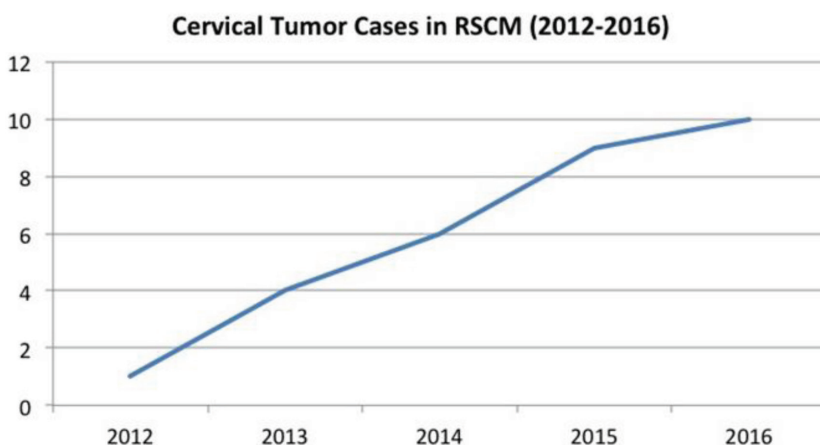
## DISCUSSION

Although the recording medical history and clinical examinations remain the mainstay to establish an indication of surgical treatment and its outcomes; magnetic resonance imaging (MRI) examination is very helpful in determining the best treatment option. MRI allows us to thoroughly evaluate the spinal cord, nerve roots, and other adjacent structures.<sup>3</sup> Therefore, the diagnosis of the disease can be established at the early stage of the natural course of the disease. Our study showed a contradictory condition in MRI era, such as the more advanced neurological condition, since myelopathy is the most common of our patients underwent C-spine surgery. It is also not in-line with other studies, where most patients came to seek medical assistance in early neurological conditions.<sup>5,6</sup> Associated factors that can be linked to patients who underwent surgery in more advanced neurological condition include delayed diagnosis of the spine disease requiring surgery in the primary and/or secondary lines of the health referral system, assumption or culture in community that spine surgery lead to paralysis so they try to find modalities of treatment other than surgery until there is no choice, lack of patient ability to pay for medical expenses, and extensive waiting list for surgery. Since the introduction of the national health insurance (BPJS) to our hospital, there is a significant increase in the number of spine surgery,<sup>4</sup> but the medical expenses would unlikely be the cause of the more advanced neurological condition of our patients. An extensive waiting list for surgery is also not likely to be the reason of our patient to seek medical assistance in the more advanced neurological condition in our hospital since the most prevalence pathology in our study is a degenerative disease in which the symptoms are very slow growing. Further study is needed to confirm the more advanced neurological condition of our patients is due to the delayed diagnosis or an inappropriate of community culture concerning spine surgery.

C-spine surgery and procedures are the second most common surgery for spine disorders or disease in our study, where the most common pathology is

**Table 1** The characteristic data of C-spine disease from 2012-2016

Age	Male	Female	Total (%)
• ≤ 30 yo	10	9	
• 31 -50 yo	29	22	
• ≥ 51 yo	41	16	
<b>Pathology</b>			
• Degenerative	55	20	59
• Tumour	14	16	23
• Trauma	6	3	7
• Congenital	3	6	7
• Infection	1	1	2
• Implant revision	1	1	2
<b>Symptoms</b>			
• Radiculopathy			18
• Myelopathy			82
<b>Procedure</b>			
• ACDF	24	19	34
• ACCF	20	3	18
• Laminectomy	15	20	27
• Laminectomy w/ fusion	19	5	19
• Laminoplasty	2	0	2
<b>LOS</b>			
• Mean/modus	10/7	10/7	



**Figure 1** The trend of tumour cases during 2012 -2016

degenerative disorders. This result was in line with previous studies in other regions.<sup>5,6</sup> The second most common pathology was a spinal tumour. Our study showed that spinal tumours are increasing in its incidence number. A higher proportion of degenerative disorder and the increase of spine tumour cases are likely to be associated with the advanced age.<sup>2,7,8</sup> The number of people with advanced age is increasing in Indonesia.<sup>9</sup>

The previous study showed anterior procedure contributes to a better outcome than posterior procedures for multilevel ossification of the posterior longitudinal ligament (OPLL) or cervical spondylotic myelopathy (CSM).<sup>10</sup> Anterior cervical discectomy and fusion (ACDF) is the most common procedure in our study, this is in-line with the most common pathology ie degenerative disease. ACDF is an effective procedure for decompression of nerve roots and/or spinal cord from an offending structure.<sup>11,12</sup> Another anterior approach in our study is anterior cervical corpectomy and fusion (ACCF). The efficacy of ACDF and ACCF was comparable for multilevel spinal cord compression. We prefer the ACCF procedure for continuous OPLL, multi-segment of segmental OPLL or disc disease that compress the spinal cord more than 50% of the normal anterior-posterior diameter of the spinal cord, and multisegmental OPLL or disc disease where the part of offending PLL or disc fragment is located in the posterior surface of the vertebral body. In spinal cord compression due to continuous OPLL requiring three or more vertebral segments or significant compression of the spinal cord located in the posterior surface of the third or second vertebral body, we substituted the ACCF procedure with laminectomy with/without stabilization. Another indication for laminectomy with/without stabilization is a spinal tumour.

The mean length of hospital stay (LOS) in our study is ten days, and the modus is seven days. Compare to the other study; our result is longer than other studies in developed countries.<sup>5,6</sup> This is likely related to 2 factors, the differences in duration of administration of the prophylactic antibiotic and the more advanced neurological condition. The policy of duration of prophylactic antibiotics administration for surgery more than 4 hours is 5 days, and surgery with implant placement is seven days. Further study is needed to reduce the duration of administration of the prophylactic antibiotic. The limitation of our study is that this study only descriptive and limited sample size.

## CONCLUSIONS

Our study showed similarity with another study in the term of the most frequent pathology and

surgical procedure, but differ from the result of studies in overseas in the term of the severity of neurological deficits. The most common symptoms and pathology are myelopathies and degenerative disease, respectively.

## REFERENCES

1. Passias PG, Marascalchi BJ, Boniello AJ, et al. Cervical Spondylotic Myelopathy: National trends in the treatment and peri-operative outcomes over 10 years. *J Clin Neurosci*. 2017 Aug; 42:75-80. DOI: [10.1016/j.jocn.2017.04.017](https://doi.org/10.1016/j.jocn.2017.04.017)
2. Kelly JC, Groarke PJ, Butler JS, et al. The natural history and clinical syndromes of degenerative cervical spondylosis. *Advances in Orthopedics*. 2012; 393642. DOI: [10.1155/2012/393642](https://doi.org/10.1155/2012/393642).
3. Malcolm GP. Surgical disorder of the cervical spine: Presentation and management of common disorders. *J Neurol Neurosurg Psychiatry*. 2002; 73(suppl1): i34-41. DOI: [10.1136/jnnp.73.suppl\\_1.i34](https://doi.org/10.1136/jnnp.73.suppl_1.i34)
4. Fabianto, Fakhri, Saekhu M. Spinal cases in Cipto Mangunkusumo General Hospital. *Asia Spine* 2015; Seoul SK.
5. Aghayev A, Sobottke R, Munting E, et al. The international spine registry Spine Tango; annual report 2015. Available from: [https://www.eurospine.org/cm\\_data/Spine\\_Tango\\_Report\\_International\\_2015\\_19\\_9\\_16.pdf](https://www.eurospine.org/cm_data/Spine_Tango_Report_International_2015_19_9_16.pdf)
6. Andersson G, Watkins Castillo SI. Spine: low back and neck pain in The burden of musculoskeletal diseases in the United States, prevalence, societal and economic cost – Bone and joint initiative USA. 2015; Available from: <http://www.boneandjointburden.org>.
7. Bonnell S, Pearsall IV AW, Heitman RJ, et al. The relationship of age, gender, and degenerative changes observed on radiographs of the shoulder in asymptomatic individuals. *The Journal of Bone and Joint Surgery*. 2000; 82-B (8):1135-9. Available from: <https://pdfs.semanticscholar.org/1ee8/4094c98d7444324613e8431ef62e14e89187.pdf>
8. Duong LM, McCarthy BJ, McLendon RE, et al. Descriptive epidemiology of malignant and nonmalignant primary spinal cord, spinal meninges, and cauda equina tumors, United States, 2004-2007. *Cancer*. 2012; 118: 4220-7. DOI: [10.1002/cncr.27390](https://doi.org/10.1002/cncr.27390)
9. Bapenas, BPS. United nation Population fund. Indonesian population projection 2010-2035. Available from: <http://www.bappenas.go.id>
10. Liu T, Xu W, Cheng T, et al. Anterior versus posterior surgery for multilevel cervical myelopathy, which one is better? A systematic review. *Eur Spine J*. 2011; 20:224-235. DOI: [10.1007/s00586-010-1486-7](https://doi.org/10.1007/s00586-010-1486-7)
11. Burkhardt JK, Mannion AF, Marbacher S, et al. A comparative effectiveness study of patient-rated and radiographic outcome after 2 types of decompression with fusion for spondylotic myelopathy: anterior cervical discectomy versus corpectomy. *Neurosurg Focus*. 2013; 35(1): E4. DOI: [10.3171/2013.3.FOCUS1396](https://doi.org/10.3171/2013.3.FOCUS1396).
12. Wen ZQ, Du JY, Ling ZH, et al. Anterior cervical discectomy and fusion versus anterior cervical corpectomy and fusion in the treatment of multilevel cervical spondylotic myelopathy: systemic review and a meta-analysis. *Ther Clin Risk Manag*. 2015; 11:161-70. DOI: [10.2147/TCRM.S72699](https://doi.org/10.2147/TCRM.S72699)



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