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THE TREND AND PROFILE OF THE THORACIC SPINE SURGERY IN NEUROSURGERY DEPARTMENT FACULTY OF MEDICINE UNIVERSITAS INDONESIA – RSUP NASIONAL DR. CIPTO MANGUNKUSUMO 2012 – 2016

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ABSTRACT

Background: Spinal surgery, in general, is increasing in number. The most frequent pathology is degenerative disease, and the most common segment is cervical and lumbar. However, there is limited information concerning the thoracic spine surgeries.

Objective: The aim of this study is to describe the trend and profile of the thoracic spine (T-spine) surgeries in the Department of Neurosurgery Faculty of Medicine Universitas Indonesia – RSUP Dr. Cipto Mangunkusumo from 2012 to 2016.

Method: This is a retrospective study including all patients who were undergoing T-spine surgery during the period of study from January 2012 to December 2016. The number of T-spine procedures was recorded and plotted in the trend graph. The data consisting age, gender, indication and procedure of T-spine surgery, and duration of hospital stay were recorded from medical records.

Result: In the last five years, there was an increasing trend of T-spine surgery. A total of 68 surgeries for T-spine performed with 35 female and 33 male subjects. Majority of subjects were aged 41 to 50 years old (28%), with an indication of surgery due to tumours (68%). As many as 76% T-spine surgery was carried out non-instrumented. Duration of hospital stay was 9-13 days.

Conclusion: Productive age is the most common age undergoing T-spine surgeries. A spinal tumour is the most frequent indication of the T-spine surgeries.

Keyword: *spinal tumour, thoracic spine surgery*

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INTRODUCTION

The number of surgeries for spinal disease as well as the use of the implant is increasing.[1] In the US, the occurrence of spine surgery has increased 2.4 fold in the last 10 years ($p<0.001$), compared to other orthopaedics or cardiac procedures.[2] Australia has reported a 16% increase in the rate of decompression, over a two-fold increase in simple fusion, and a four-fold increase in complex fusion.[3]

Many previous studies only showed the number of the cervical spines (C-spine) and lumbar spines (L-spine) surgery[3,4] and there was limited information concerning about the thoracic spine (T-spine) surgery.[5] T-spine surgery itself is a viable option for several spinal conditions caused by tumour, degenerative, trauma, infection, or congenital defects.[6] In Korea, degenerative was the most common cause of subjects who underwent T-spine surgery.[7]

In Indonesia, no study specifically assessed the profile of subjects undergoing T-spine surgery. Here, we would like to report our data of T-spine surgery during five years from a single institution to elucidate the demographic profile, pathology, surgical procedure of choice, and duration of hospital stay. The results of this study will be benefited for characterizing subjects undergoing T-spine surgery and indirectly taken to be a concern for health coverage.

METHODS

This is a retrospective study conducted in the spine division of the Department of Neurosurgery, Faculty of Medicine Universitas Indonesia (FMUI) – RSUP Nasional Dr. Cipto Mangunkusumo Jakarta. All patients who underwent surgery for the T-spine disease during the five years from January 2012 until December 2016 are included in this study.

The data consisting of age, gender, indication and procedure of T-spine surgery, and duration of hospital stay were recorded from medical records. The surgical indications are established by a history of the disease, findings of neurological examinations, and confirmed by magnetic resonance imaging (MRI) examination. The mean duration of hospital stay was categorized based on the surgery indication. The data were tabulated and presented descriptively.

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RESULTS

During the study period, there were 68 surgical procedures of the T-spine surgeries, these included 35 female and 33 male subjects. Most subjects that underwent surgery were those in the productive age group, with 64% of patients ranging from 31 to 60 years old. The most common pathology indication for T-spine surgery was tumours (68%), followed by degenerative diseases (13%), and infection (10%). The major tumour type was schwannoma (27%) and meningioma (22%). Instrumented T-spine procedures, T-spine stabilization by pedicle screws and rods placement, were done in 23% procedures. The mean duration of stay varies between 8 days to 13 days depending on the pathology. The length of hospital stay of infection cases was the longest. (Table 1).

Table 1 **The characteristic data of T-spine surgery from 2012 to 2016**

Age	
• ≤20 yo	4 (6%)
• 21 - 30 yo	10 (14%)
• 31 – 40 yo	12 (17%)
• 41 – 50 yo	19 (28%)
• 51 – 60 yo	13 (19%)
• 61 – 70 yo	9 (13%)
• ≥ 71 yo	2 (3%)
Sex	
• Male	33 (49%)
• Female	35 (51%)
Pathology	
• Tumour	46 (68%)
o Schwannoma	18 (27%)
o Meningioma	15 (22%)
o Others	13 (19%)
• Degenerative	9 (13%)
• Infection	7 (10%)
• Trauma	5 (7%)
• Congenital	1 (2%)
Surgical Procedure	
• Non-instrumented	52 (76%)
• Instrumented	16 (24%)
Mean duration of hospital stay	
• Tumours	10 days
• Degenerative	9 days
• Trauma	8 days
• Congenital	11 days
• Infection	13 days

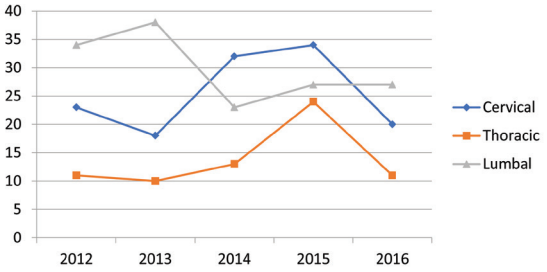

Figure 1 The trend of T-spine surgery over 5 year

The number of T-spine surgery in our study showed an increase but not in the year 2016. A decrease in the number surgeries was also observed for cervical and lumbar spine diseases. It is believed to be related to a policy in which the day of surgery for spine cases is reduced from three days a week to one day a week. Compared to the surgery in the other spinal segment, T-spine surgery is the lowest (Figure 1).

DISCUSSION

The worldwide study showed that the demand for spine surgery was increasing in the last 10 years.[5] An increase is also seen in T-spine surgery with very limited data.[2] In Indonesia, this is the first study that specifically describes the trend of T-spine surgery in the last 5 years, with the peak procedures performed in 2015. In the year of 2016, due to the extraordinary increase of the brain tumour cases along with the limited operating theatre, the day for spine surgery is reduced from three days a week to one day a week. The T-spine surgery showed reduction again. In addition to the trend of an increasing number of surgeries, implant use has also increased.[2] The present study showed only one-fourth of our cases was instrumented. The previous study showed the increase in instrumentation is driven by the increase in spinal deformity,[1] oncological, and trauma cases.[2] Spinal deformity cases are limited in our institution. Our study also showed a harmony with the previous study that T-spine surgery is less frequent than C-spine and L-spine surgeries.[2,8]

The present study showed T-spine surgeries have a different character with spinal surgeries in general. In the C-spine and L-spine, the most frequent indication are degenerative diseases.[9,10] Our study showed in the T-spine, the most frequent indication is spinal tumours. This is in concordance with the previous study that the T-spine is a predilection of the spinal tumours[6] and spinal tuberculosis.[7] However, spinal tuberculosis (infection) cases were less frequent than a spinal tumour and degenerative disease (Table 1).

In addition to the differences in the pathology, our study showed the most frequent age to undergo

T-spine surgery was among patients 41 to 50 years old, unlike in Japan which the most frequent age who was undergoing spinal surgeries, in general, was among patients aged over 70 years old.[6]

The limitation of this study was that authors only took data from one institution. Authors hoped that in the future study, the descriptive study focusing on only T-spine surgery could be performed in the larger population.

CONCLUSION

The productive age group is the most common age undergoing spinal surgery, while tumours are the most common cause of disease. Instrumented cases are one-fourth of all cases.

CONFLICT OF INTEREST

The authors affirm no conflict of interest in this study.

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