J. Tokyo Med. Coll., **54**(3): 253～263, 1996

Posterior Decompression Surgery of Thoracic Myelopathy due to Ossification of Intraspinal Canal Ligaments

Yoshinori TAKEI

Department of Orthopaedic Surgery, Tokyo Medical College
(Director : Prof. Yukio MIURA)

Abstract and Conclusions

Study Design : This study retrospectively reviewed postoperative outcomes of thoracic myelopathy due to ossification of intraspinal canal ligaments.

Objectives : The purpose of this study was to clarify the advantages and limitations of posterior decompresion surgery, as well as factors to leading to poor results.

Summary of Background Data : Many different types of surgical decompressions have been reported. There is no universally accepted conclusion as to which procedure can contribute to good outcomes.

Methods : We examined 32 patients who had had thoracic myelopathy due to ossification of intraspinal canal ligaments and upon whom we operated using posterior decompression between 1980 and 1994.

Results : The surgical outcomes were evaluated according to the Assessment of Treatment for Cervical Spondylotic Myelopathy of the Japanese Orthopaedic Association with a maximum score of 11 points excluding upper extremity function. For all 32 cases, the preoperative score was 4.3 points, increasing to 7.2 points at the last follow-up. The improvement rate was 43.7%. Factors leading to poor results included preoperative lower extremity function, length of illness, multiple ossification, ossification level, progress of ossification, degree of thoracic kyphosis, and complications.

Conclusions : Good results were obtained for cases in which OPLL continued from the cervical to the upper thoracic spine, or was present only in the lower thoracic spine. The improvement rate of OPLL cases in the region of thoracic kyphosis was low. Among these, the conditions of some cases deteriorated with time, indicating the limitations of posterior decompression surgery for the region of thoracic kyphosis.

Introduction

Ossification of thoracic spinal ligaments appears to be related to spinal ligament ossification. Despite this, most ossifications of the cervical spinal ligaments consist of ossification of posterior longitudinal ligament (abbreviated OPLL). Conversely, ossification of intraspinal canal ligaments causing compres-

Received Feb. 19, 1996, Accepted Mar. 7, 1996

Key words : Ossification of intraspinal canal ligaments, Thoracic myelopathy, Thoracic spine, Posterior decompression surgery.

(**Reprint requests to** : Department of Orthopaedic Surgery, Tokyo Medical College, 6-7-1, Nishi-shinjuku, Shinjuku-ku, Tokyo 160 Japan)

sion of the thoracic segment of spinal cord is OPLL, or ossification of ligamentum flavum (OLF). These conditions can occur either alone or in combination. Most cases of disorders of the thoracic spinal cord resulting from ossification of the thoracic spinal ligaments present difficulties in obtaining the desired postoperative outcomes compared with cases involving the cervical spine alone.

Even nowadays there are lots of discussions regarding surgical procedures. This paper reports the posterior decompression surgery conducted by our department for ossifications of the thoracic spinal ligaments, postoperative outcomes, factors contributing to poor results, countermeasures, limitations, etc.

Methods

The subjects were 32 patients with thoracic myelopathy due to ossification of intraspinal canal ligaments, on whom we operated using posterior decompression between 1980 and 1994. They consisted of 24 males and 8 females, whose ages at the time of operation ranged from 36 to 78 years (average 56). The period of postoperative observation ranged from 6 months to 12 years (average 6 years). Specifically there were 18 cases of single ossification of the thoracic spinal ligament, 14 cases of multiple ossifications of the cervical and the thoracic spinal ligaments. Concerning the level of figament ossification, 80% of OLF existed in the lower thoracic spine. All accompanying ossifications of the cervical spinal ligament consisted of OPLL. Of 14 cases, 9 cases had continuous cervical OPLL (Fig. 1).

Wide laminectomy was performed in cases with thoracic spinal OPLL. Recently expansive open-door laminoplasty has been performed to prevent postoperative complications. For thoracic OLF, en bloc laminectomy including the ossified region was performed. The number of decompressed laminae ranged 2 to 10, with an average of 5 laminae. For multiple ossifications of the cervical and the thoracic spinal ligaments, a simultaneous surgery was performed in 5 cases, and also two-stage surgery in 7 cases. In 2 cases only thoracic spinal decompression was performed (Table 1).

Results

The surgical outcomes were evaluated according to the Assessment of Treatment for Cervical Spondylotic Myelopathy of the Japanese Orthopaedic Association (JOA score) with a maximum score

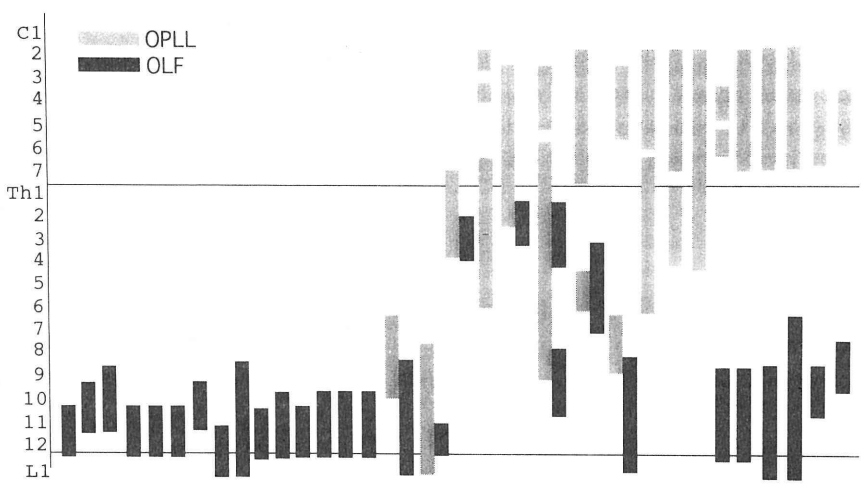

Fig. 1. Level of ossification of intraspinal ligaments.
There were 18 cases of single ossification of thoracic spinal ligament, and 14 cases of multiple ossification of the cervical and the thoracic spinal ligaments.

Table 1. Methods of surgery.

Level of ossification		Surgery		Number of cases
		Cervical spine	Thoracic spine	
Only in the thoracic spine		—	Laminectomy	18 Cases
Both in the cervical and the thoracic spine	Simultaneous surgery	Laminectomy	Laminectomy	1
		Laminoplasty	Laminectomy	1
		Laminoplasty	Laminoplasty	3
	Two-stage surgery	Laminectomy	Laminectomy	5
		Laminectomy	Laminoplasty	1
		Laminoplasty	Laminectomy	1
	Only thoracic decompression	—	Laminectomy	2

of 11 points excluding upper extremity function. The percentage of improvement was evaluated using the Hirabayashi's formula (Table 2). Numerous factors were compared and studied ; e. g., age, preoperative severity, length of illness, ossification level, number of decompressed laminae, degree of thoracic kyphosis, etc.

For all 32 patients, the preoperative average was 4.3 points, increasing to 7.2 points at the last follow-up (Table 3). The improvement rates for lower extremity function, sensory function, and bladder bowel function were 43.9±20.2%, 38.5±19.8%, and 52.0±23.3%, respectively. Although recovery of lower extremity function and sensory function appeared poor, no statistically significant difference was seen between any two items.

As to age at the time of operation, the cases were studied after division into the prime age group below 55 years and the comparatively elderly group of 55 or more. Again no significant difference was observed between those two groups. Concerning the preoperative severity, 9 cases that scored below 3 points preoperatively acquired 2.6 points, with an improvement rate of 31.3%. The 23 cases that scored above four points acquired 3.2 points, with an improvement rate of 48.6%, indicating no significant difference between the two groups. The improvement rate, however, of the group with moderate illness was good, and the scores of improvement increased in this group. Comparing preoperative lower extremity function, the group scored fewer than one point preoperatively showed a poor improvement. This was significantly lower than the group that scored more than two points preoperatively (Table 4). Concerning the history of illness, cases that received early stage operation within 6 months scored an average of 4.2 points preoperatively. Postoperative score jumped to an average of 8.2 points, with a favorable improvement rate of 58.8%. Regarding the cases with a long history of more than 2 years, the preoperative score was 3.1 points. Postoperatively, the score rose only to 4.8 points showing a low improvement rate 18.8% ($p < 0.05$). Cases with ossification of the upper and the lower thoracic spine obtained relatively favorable scores and improvement rates postoperatively. Cases with ossification of the middle thoracic spine obtained only poor results (Table 5). The cases with a low number of decompressed laminae attributable to regional OLF, etc. showed good overall improvement. Conversely, cases with decompression of OPLL in only the thoracic spine had greater number of decompressed laminae, along with ossification extension,

Table 2. Assessment of treatment for Cervical Spondylotic Myelopathy by The Japanese Orthopaedic Association.

I. Upper extremity function
 0. Impossible to eat with either chopsticks or spoon
 1. Possible to eat with spoon, but not with chopsticks
 2. Possible to eat with chopsticks, but inadequate
 3. Possible to eat with chopsticks, but awkward
 4. Normal
II. Lower extremity function
 0. Impossible to walk
 1. Need cane or aid on flat ground
 2. Need cane or aid only on stairs
 3. Possible to walk without cane or aid, but slow
 4. Normal
III. Sensory
 A. Upper extremity
  0. Apparent sensory loss
  1. Minimal sensory loss
  2. Normal
 B. Lower extremity
  0. Apparent sensory loss
  1. Minimal sensory loss
  2. Normal
 C. Trunk
  0. Apparent sensory loss
  1. Minimal sensory loss
  2. Normal
IV. Bladder function
 0. Complete retention
 1. Severe disturbance
  (1) Inadequate evaluation of the bladder
  (2) Straining
  (3) Dribbling urine
 2. Mild disturbance
  (1) Urinary frequency
  (2) Urinary hesitancy
 3. Normal

$$\text{Percentage of improvement (by Hirabayashi method)} = \frac{\text{Postoperative JOA score - Preoperative JOA score}}{\text{17 (full score) - Preoperative JOA score}} \times 100\ (\%)$$

causing considerable inconsistencies in the results. In case of decompression performed from the cervical to the upper thoracic spine for OPLL in that region, good improvement score and rate were obtained in some cases despite the procedure performed over a broad range involving more than 8 laminae (Table 6). In the group undergoing posterior decompression which the subarachnoid space in behind the spinal cord had not disappeared on the CT myelography (CTM) image of the preoperative decompression level, improvements were poor compared with the group which showed disappearance of subarachnoid space (Table 7). The spinal cross-sectioned area of the most severely stenotic site in the preoperative CTM showed no significant difference in the improvement rate. The thoracic kyphosis was 10° -56° (averaging 36°). Looking only at the thoracic OPLL, cases with poor improvement rates had strong kyphosis compared with the average (Fig. 2). An increase of more than 10° in thoracic kyphosis was seen postoperatively in 3 cases that received only laminectomy. This was not observed in the cases that underwent expansive laminoplasty. Of 8 cases in which more than 5 years had passed since their thoracic OPLL operation, 2 cases showed progress in ossification along the longitudinal axis. One of these which showed progression in more than 1 vertebral body suffered recurrence because of the presence of OLF at the base. Increased thickening was observed in only 1 case with little influence on the results. Cases with single ossification of the thoracic spine with a high preoperative score also showed good improvement at an early stage postoperatively. For cases with accompanying isolated cervical OPLL, inconsistencies were seen in the results at an early postoperative stage and during long-term follow-up (Fig. 3).

The another factors contributing to the cases with poor results were OPLL of the thoracic kyphosis peak (3 cases), progression of OPLL (2 cases), combing lumbar canal stenosis (2 cases), increased kyphosis, laminectomy of OPLL over a broad range, and surgical technique on salvaging surgery (1 case each), etc. Among 12 cases of multilevel ossification of the cervical and the thoracic spine, 7 cases were diagnosed from the outset as having double lesions. And 5 cases underwent simultaneous operation. Planned two-stage operations were performed early on 2 cases over a short period. Although the postoperative follow-up period was short, the results were good in cases treated by simultaneous surgery. Five cases underwent additional posterior decompression surgery of the thoracic spine because of further deterioration in lower extremity function after the first cervical spinal surgery. Most of these cases had

Table 3. Postoperative results concerning the level and the type of ossification.

Level of ossification	Type of ossification	Preoperative JOA score	Postoperative JOA score	Percentage of improvement
Only in the thoracic spine	T OLF	4.3±2.1	7.3±2.0	43.9±25.6
	T OPLL+T OLF	4.7±2.5	7.3±2.1	40.0±23.5
Both in the cervical and the thoracic spine	OPLL continuing from C to T	6.0±1.9	10.0±2.4	80.0±29.8
	OPLL continuing from C to T + T OLF	5.5±1.5	8.5±2.5	54.5±26.4
	C OPLL + T OPLL not continuing from C	3.3±2.0	4.3±2.2	13.0±14.1
	C OPLL + T OLF	3.5±1.2	6.8±1.8	42.7±24.2
	Average	4.3±2.2	7.2±2.3	43.7±26.5

OPLL = ossification of the posterior longitudinal ligament
OLF = ossification of ligamentum flavum
C = Cervical T = Thoracic JOA = Japanese Orthopaedic Association

Table 4. Postoperative results concerning the lower extremity function.

Clinical features	Preoperative lower extremity function		t-Test
	Fewer than one point group	More than two points group	
Number of cases	18	14	—
Age (yrs)	57.0±12.2	54.9±13.6	n.s.
Duration (mo)	15.2±10.7	11.4±8.4	n.s.
Preoperative JOA score	3.5±1.5	5.6±1.5	—
Postoperative JOA score	5.7±1.7	9.2±1.6	—
Improvement score	2.1±1.5	3.5±1.7	$p<0.05$
Percentage of improvement (%)	28.2±21.4	64.0±28.9	$p<0.05$

JOA = Japanese Orthopaedic Association n.s. = not significant

low scores on follow-up (Fig. 4).

Discussion

The thoracic spine is anatomically stable, and is the least mobile part of the spine overall. In compression of the thoracic spinal cord, static compression factors are the principal component other than dynamic factors. In the thoracic spinal ligament ossification, conservative treatments hold no hope of improvement, and in most cases surgery is required[1]. In some cases, because the thoracic myelopathy can deteriorate rapidly, early stage operations are required when symptoms of compression appear[2)3)].

The posterior decompression surgery performed for OPLL of the thoracic spine as compared to that for OPLL of the cervical spine do not always produce the desired results. In some cases exacerbation of

Table 5. Postoperative results concerning the level of ossification.

Clinical features	Level of ossification		
	Upper thoracic spine	Middle thoracic spine	Lower thoracic spine
Number of cases	4	8	20
Age (yrs)	49.3±10.4	58.6±8.0	55.1±8.2
Duration (mo)	12.7±8.7	12.4±8.2	13.8±10.0
Preoperative JOA score	5.3±1.8	3.7±2.0	4.3±2.0
Postoperative JOA score	9.5±2.4	5.6±2.3	7.4±2.0
Improvement score	4.1±1.9*	1.8±1.4*	3.1±1.9
Percentage of improvement (%)	72.4±29.8**	24.7±17.8**	45.8±22.4

JOA = Japanese Orthopaedic Association * $p<0.05$ ** $p<0.05$ (t-Test)

Table 6. Postoperative results concerning the decompressed range.

Level of decompression	Number of decompressed laminae	Number of cases	Preoperative JOA score	Postoperative JOA score	Percentage of improvement
Only thoracic spine decompression	2	8	3.6±1.6	7.3±2.0	50.0±18.0
	3	5	4.0±2.0	6.6±2.3	37.1±16.5
	4	8	4.9±1.9	6.7±2.8	28.2±13.5
	6~8	6	3.8±2.4	6.7±2.6	39.2±18.5
Simultaneous decompression both the cervical and the thoracic spine	8 (C3~Th3)	1	6	8	40
	8 (C4~Th4)	1	7	11	100
	9 (C3~Th4)	1	7	11	100
	9 (C6~Th7)	1	5	9	66.7
	10 (C2~Th4)	1	3	7	50

JOA = Japanese Orthopaedic Association

symptoms has been reported[2)4)5)]. Factors that can be considered are as follows: there is a limit to posterior decompression surgery in the region of physiological thoracic kyphosis, there is considerable compression of the thoracic spinal cord at the several points, ossification is seen in regions equivalent to critical vascular zones in terms of spinal blood flow, postoperative thoracic kyphosis increases as a result of the invasion to the posterior spinal elements, and accompanying OLF is frequently seen in numerous cases.

Conversely, in OPLL of the thoracic spine with compression lesions anterior to the spinal cord, anterior decompression surgery is logical. Outstanding results are also reported in physiological thoracic spinal kyphosis[2)6)]. However there are numerous problems, e.g. limits to posterior decompression over a broad

Table 7. Postoperative results concerning the preoperative CTM image.

Clinical features	Preoperative CTM image		t-Test
	SAS (−) group	SAS (+) group	
Number of cases	26	6	—
Age (yrs)	54.5±18.6	62.3±14.3	n.s.
Duration (mo)	13.5±9.0	17.5±8.2	n.s.
Preoperative JOA score	4.3±1.4	4.0±1.7	n.s.
Postoperative JOA score	7.8±2.0	4.5±2.1	$p<0.05$
Improvement score	3.5±1.8	0.6±1.0	$p<0.05$
Percentage of improvement (%)	52.2±15.6	7.4±10.2	$p<0.05$

JOA = Japanese Orthopaedic Association n.s. = not significant
SAS (−) = disappearance of subarachnoid space in behind the spinal cord of the decompressed level
SAS (+) = appearance of subarachnoid space in behind the spinal cord of the decompressed level
CTM=CT myelography

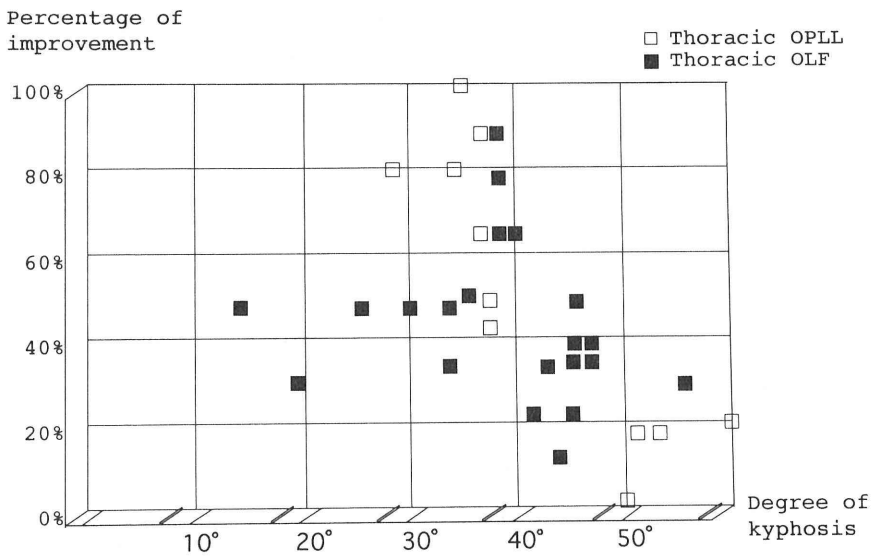

Fig. 2. Percentage of improvement concerning the thoracic kyphosis.
The thoracic kyphosis from Th1 to Th12 was 10° −56° (average 36°). Cases with poor outcome had strong kyphosis compared with the average.

region, limits in its applications to OPLL accompanying OLF, a marked degree of surgical invasiveness, and a high level of surgical skill. Because posterior decompression surgery makes multilevel decompression possible and presents few problems concerning surgical invasiveness and technique[7], the posterior procedure is advantageous for accompanying OLF, a posterior compressive element. We performed the posterior decompression for cases requiring decompression over a broad area in cases of OPLL of the thoracic spine, and for cases with accompanying OLF[3].

In cases where lower edge of OPLL dose not reach the most prominent point of the kyphosis even if

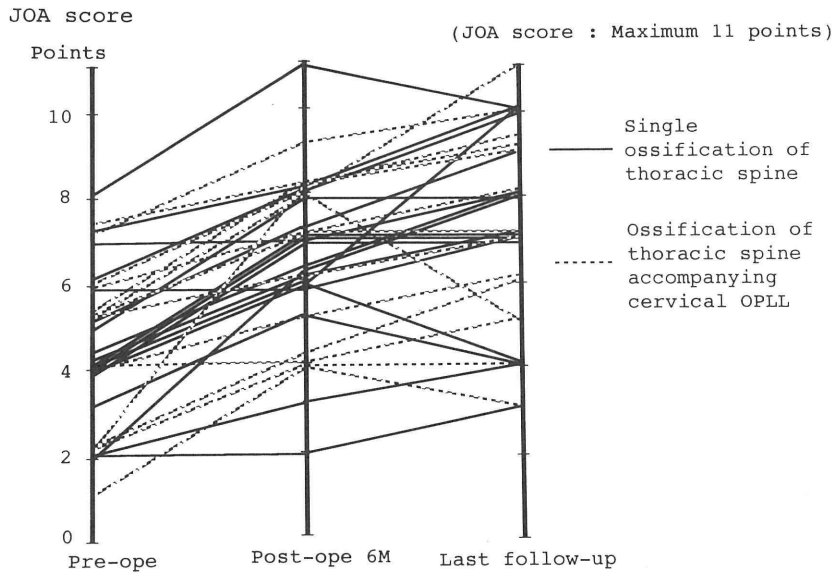

Fig. 3. Postoperative results of thoracic myelopathy due to ossification of the intraspinal canal ligaments.
For cases with accompanying isolated cervical OPLL, inconsistencies were seen in the results. There was the difficulty of treating multilevel ossification.

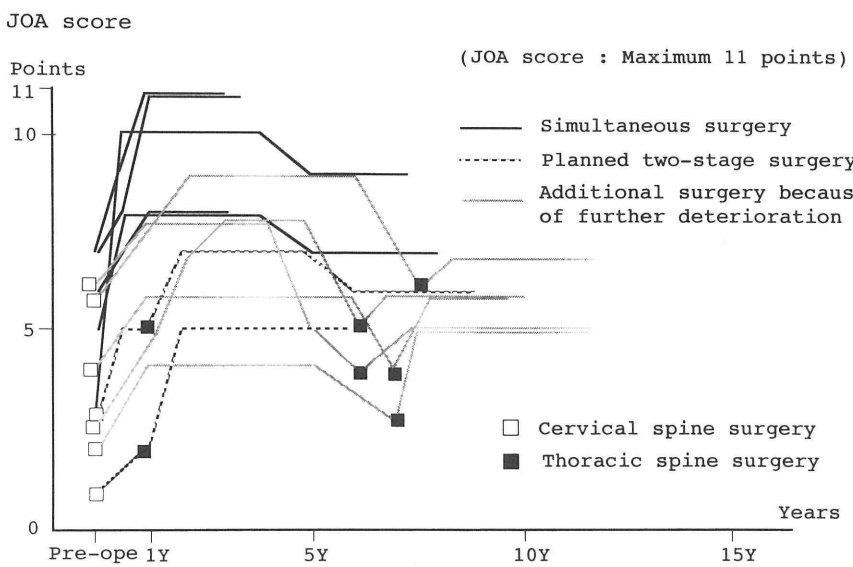

Fig. 4. Long-term follow-up of multilevel ossification.
Twelve cases of multilevel ossification were operated both the cervical and the thoracic spine. It seems that postoperative results were good in cases treated by simultaneous surgery.

OPLL continues from the cervical to the thoracic spine, and in cases where ossification is limited to the lower thoracic spine, relatively good results are obtained. Conversely, the improvement rate is low in many cases in which posterior decompression was performed over a broad area for OPLL of the thoracic kyphosis region. In some cases symptoms recurred even after temporary improvement. In addition, other factors related to poor results include preoperative severity, especially in cases with poor lower extremity function, and prolonged illness. Thus, for early stage cases in which the thoracic myelopathy is not severe, and for OPLL cases with a low degree of kyphosis, relatively stable and good results can be expected with posterior decompression surgery[8]. Posterior decompression surgery, however, has its limitations. For OPLL in thoracic kyphosis region, cases showing a subarachnoid space in behind the spinal cord visible on the CTM image, and OPLL with a relatively short extent, we recently employ anterior decompression as the first treatment of choice because an adequate decompression for thoracic spinal cord cannot be gained by posterior procedure alone[8]. Anterior decompression surgery can consist of an anterior approaching anterior decompression, posterior approaching anterior decompression, and circumspinal decompression of the spinal cord through anterior and posterior approaches, etc. Different surgeons choice different methods[2)5)6)9)].

In ossification of the thoracic intraspinal canal ligament, difficulties are often experienced in neurological diagnosis and in determing the decompression range. Neurological examination is essential, but the results in the involving the thoracic spine differ from those of the the cervical spinal or the lumbar spinal lesions, etc. In some cases, moreover, the degree of severity cannot be evaluated easily by sensory disturbance, muscular strength, deep tendon reflex, etc. Concerning the neurological diagnosis of myelopathy due to the ossification of the spinal canal ligaments at both cervical and thoracic spines, it has been reported that the presence of white matter disorders in the cervical spinal cord plays an important role[10]. It has also been clarified that the somatosensory evoked potential (SSEP) correlates with the severity of the myelopathy. It has also been reported that SSEP abnormalities can indicate the level on the spine responsible for the disorders[11]. However, it is extremely difficult to diagnose the upper and lower margins of the disorders. Accordingly, it is necessary to conduct comprehensive imaging diagnosis, electrophysiological diagnosis such as SSEP, as well as neurological examinations in order to determine the decompression range. For tandem lesions located in the thoracic and either the cervical or the lumber spine, extreme care must be exercised to determine the level of the spine responsible for disorders, the severity and the surgical order of priority. In cases of multiple ossifications in both the cervical and the thoracic spines, simultaneous decompression should be considered after the strict selection of cases. In OPLL of the thoracic spine over a broad region, there is a limitation to the range of decompression despite the use of posterior decompression. Decompression, moreover, may not necessarily be adequate. There exists a possibility that compression of the spine attributable to a broad OPLL may be related to irreversible changes of the spinal cord, demonstrating limitations of posterior decompression[7]. This requires consideration of the method of decompression of the thoracic spinal cord according to the illness, as well as a surgical method to be carefully applied to the delicate spinal cord[12)13)]. Because in some cases in which results diminish with time, problems such as complications should always be considered. It is important to operate as promptly as possible for cases requiring additional decompression[2)].

Acknowledgments

I am grateful to prof. Y.Miura for reviewing the manuscript. I also thank Drs. M.Komagata and Y. Inahata for their help.

This study was partially supported by a grant from the Investigation Committee on the Ossification of the Spinal Ligaments of the Japanese Ministry of Public Health and Welfare, and also presented at the 24th Annual Meeting of the Japan Spine Research Society, June 2-3, 1995, Tokyo, Japan.

References

1) Miura Y MD. Ossification of posterior longitudinal ligament. In : Ohno T MD, ed. Clinical Orthopedics 6. 1st ed. Tokyo : Chugai Igaku Co., 1988 ; 270～283.
2) Fujimura Y, Koyanagi T, Toyama Y, Hirabayashi K. Long-term results of anterior decompressive surgery for thoracic myelopathy due to ossification of posterior longitudinal ligament. Spine & Spinal Cord 1993 ; **6** : 873～879.
3) Miura Y, Inahata Y, Komagata M, Tanaka S, Kawai K, Shiotsu T. Clinical study of thoracic spinal cord compression due to ossification of the spinal canal ligaments. Investigation Committee Report on the Ossification of the Spinal Ligaments of the Japanese Ministry of Public Health and Welfare. 1991 : 328～331.
4) Miyazaki K, Kirita Y, Hayashi T, Nosaka K, Shima M, Yamamura H, Tamaki S. Surgical treatment for ossification of the posterior longitudinal ligament of the dorsal spine. The Central Japan Journal of Orthopaedic Surgery & Traumatology. 1975 ; **18** : 982～985.
5) Ohtsuka K, Terayama K, Wada K, Kinoshita H, Takahashi S, Murata S. The results of surgical treatment for thoracic myelopathy due to ossification of the posterior longitudinal ligament. Clinical Orthopaedic Surgery. 1988 ; **23** : 467～472.
6) Otani K. Anterior surgical decompression for myelopathy due to OPLL of the thoracic spine ; it's result and indication. Orthopedic Surgery 1993 ; **44** : 1233～1239.
7) Abe R, Tsuzuki N, Saiki K, Kondo T, Wadano Y, Kikuchi S. The effect of extensive cervicothoracic laminoplastic decompression for OPLL of the thoracic spine. Orthopedic Surgery 1993 ; **44** : 1246～1252.
8) Abumi K, Kaneda K, Hatayama A. Indication and limitation of posterior decompressive procedures for ossification of the posterior longitudinal ligament of thoracic spine. Spine & Spinal Cord 1993 ; **2** : 678～682.
9) Tomita K, Toribatake Y, Kawahara N, Takahashi K, Baba H. Circumspinal decompression for thoracic myelopathy due to combined ossification of the posterior longitudinal ligament and yellow ligament. Spine & Spinal Cord 1993 ; **6** : 881～887.
10) Taneichi H, Kaneda K, Abumi K, Kurakami C. Neurological diagnosis of myelopathy due to the ossification of the spinal canal ligaments at both cervical and thoracic spine. Clinical Orthopaedic Surgery. 1991 ; **26** : 579～586.
11) Baba H, Imura S, Kawahara N, Kikuchi Y, Tomita K. Spinal cord evoked potentials in thoracic myelopathy. Clinical Orthopaedic Surgery. 1991 ; **34** : 853～860.
12) Kurosa Y, Yamaura I, Nakai O, Yoshida H, Shindo S, Shinomiya K, Matuoka T. Selection of operative methods for thoracic myelopathy caused by ossification of the posterior longitudinal ligament. Clinical Orthopaedic Surgery. 1995 ; **30** : 513～520.
13) Murase M, Igata T, Yagi S, Shinohara K, Masaki K, Tamura A, Kashiwaguchi S, Yamashita M. Clinical review of poor results for ossification of intraspinal canal ligament. Clinical Orthopaedic Surgery. 1988 ; **23** : 473～479.

脊柱管内靱帯骨化による胸椎部脊髄症に対する後方除圧術の成績と適応限界

武井良憲

東京医科大学整形外科学教室
(指導：三浦幸雄主任教授)

胸椎部脊髄症の原因として脊柱管内靱帯骨化は最も頻度の高いものであるが，頚椎部靱帯骨化症の成績に比較して満足のいく術後結果が得られない場合が多く，手術方法に関しても現在なお多くの議論がある．本稿では，胸椎部脊柱靱帯骨化症に対し当科で行った後方除圧術の術後成績から成績不良因子，その対策，手術の限界などにつき検討した．対象は当科で手術治療を行った男24例女8例の計32例で，手術時年齢は平均56歳，術後経過観察期間は平均6年であった．骨化の内訳は胸椎単独靱帯骨化症18例，頚胸椎重複靱帯骨化症14例で，後縦靱帯骨化症(以下OPLLと略す)に対しては広範囲椎弓切除術，または脊柱管拡大術を，黄色靱帯骨化症（以下OLFと略す）に対しては骨化部を含めたen bloc椎弓切除を行った．成績評価は日整会頚椎症性脊髄症治療成績判定基準から上肢機能を除いた11点満点で行ない，平林法による改善率を求めた．全32例では術前平均4.3点が最終追跡時には平均7.2点となり，平均改善率は43.7%であった．成績を左右する因子としては，術前下肢機能，罹病期間，重複骨化，骨化高位，骨化の厚さ，術後の骨化進展，後弯度，頚椎症性脊髄症や腰部脊柱管狭窄症の合併などが考えられた．OPLLでの多椎間除圧やOLF合併例などに後方除圧術を行ってきたが，OPLLが頚椎から上位胸椎に連続している症例や，下位胸椎に限局する症例では良好な結果を得たものの，胸椎後弯部OPLLや上位，下位胸椎でも骨化の厚いOPLL例の改善率は低く，経過中に再悪化したものが8例あり，後方除圧術のみでは限界と思われた．責任高位の早期診断を厳密に行い手術時期を逸しないこと，各種の前方除圧法を含めた病態に即した術式適応と除圧範囲を検討する事は勿論，易損性にある脊髄に対しての愛護的な手術操作，手術方法の改良が要求される．

キーワード： 脊柱管内靱帯骨化，胸髄症，胸椎，後方除圧術．