Interventional pain managements for Bertolotti's syndrome like low back pain patients : A retrospective study

R. Yamada¹, H. Uchino¹, H. Fukui¹, Y. Ogiwara¹, T. Itabashi¹, K. Ohseto¹
Department of Anesthesiology, Tokyo Medical University - Tokyo (Japan)

【Background and Goal of Study】

Bertolotti's syndrome like low back pain is similar symptom to Bertolotti's syndrome's one that is characterized by the presence of nonunion between the fifth lumbar vertebrae transverse process and sacrum unilaterally or bilaterally mainly in the young generation (Fig.1,2). In this study, we examined whether Interventional pain managements (IPM) are able to improve Bertolotti's syndrome like low back pain or not retrospectively.

Fig.1 Nonunion between L5 transverse process and sacrum (fluorography)

Fig.2 Nonunion between L5 transverse process and sacrum (3D-CT)

【Materials and Methods】

This research was approved by ethical committee of Tokyo Medical University. We have analyzed 489 patients who visited our pain clinic due to a low back pain during the period from April 2012 to September 2016. **First**, we have picked up the patients who had the narrow space or nonunion (not fusion) between the fifth lumbar vertebrae transverse process and sacrum by X-ray images unilaterally or bilaterally, and showed a tenderness in the same area (Fig.3). And, we classified them into 4 types by a review of Castellvi (Fig.4). **Second**, we have examined the reproduced or radiating pain by needle insertion, contrast injection into the nonunion between the fifth lumbar vertebrae transverse process and sacrum (Fig.5). **Finally**, we have defined that patients showed the disappearance of reproduced pain by local anesthetics and IPM (radiofrequency thermocoagulation 80 °C 90sec.) are Bertolotti's syndrome like low back pain positive. And we have evaluated the change of pain dynamics before and after IPM by Numerical Rating Scale (NRS), respectively. Data were shown as mean $\pm$ S.D. and statistically analyzed by paired-t test and accepted $p < 0.05$ is significant.

Fig.3 Tenderness and radiating pain by needle insertion

Fig.5 Spread of contrast media surround the nonunion between L5 transverse process and sacrum

Fig.4 Radiographic classification

【Results and Discussion】

68 of 489 patients were suspected Bertolotti's syndrome like low back pain at the first medical examination. And 25 of 68 patients who showed the localized tenderness. 13 of 25 patients showed the reproduced or radiating pain caused by needle insertion and contrast injection. Trial blocks by local anesthetics and IPM under fluoroscopy were effective (Table 1). From our result, rate of the patients with Bertolotti's syndrome like low back pain were 2.7% of whole patients. IPM showed the significant reduction of the pain (NRS before IPM was 8.3 ± 0.4 , and after IPM was 3.4 ± 0.2) ($p < 0.0001$). Most of these patients got the continuous good pain relief after first IPM and they sometimes had second IPM at the interval between 6 months and one year from first IPM.

One of the possible cause of this pathogenesis is based on the degeneration of intervertebral disc due to aging. It may lead to decrease of disc height or scoliosis, and make the narrow space or nonunion between the fifth lumbar vertebrae transverse process and sacrum. According to the cadavers analysis, we detected existence of the posterolateral branch (PLB) of the spinal nerves in the same area (Fig.5). And we suspect that the posterior branch causes Bertolotti's syndrome like low back pain. But, it is not clear and we need further analysis.

Patient	Age	Sex	Type	NRS at first visit	NRS after IPM
1	53	M	II B	8	3
2	61	M	II A	10	4
3	65	M	I B	9	3
4	82	M	I A	5	2
5	51	F	II A	8	3
6	62	F	I A	10	4
7	65	F	II A	8	4
8	66	F	I B	9	4
9	72	F	II A	7	2
10	74	F	II A	8	3
11	75	F	IV	10	6
12	79	F	II A	6	2
13	80	F	II B	10	4
average(SD)	68.1			8.3(± 0.4)	3.4(± 0.3)*

Table 1 Characteristics of the patients
*denotes significant vs first visit $p < 0.0001$

Fig.5 trajectory of PLB for nonunion

【Conclusions】

Causes of Bertolotti's syndrome like low back pain are not well known whether these are due to congenital or acquired. We still need further analysis regarding the patients to whom we suspect Bertolotti's syndrome like low back pain. From our study, appropriate diagnosis and treatment such as IPM lead to good pain management.

【Reference】
J.F.Quinlan. Bertolotti's syndrome; a cause of back pain in young people. The Journal of Bone and Joint Surgery (BR) 2006 88-B: 1183-1186
Anuj Jain. Bertolotti Syndrome: A Diagnostic and Management Dilemma for Pain Physicians. Korean J Pain 2013 October; vol.26 No.4: 368-373
Jeffrey M. Jancuska. A review of symptomatic lumbosacral transitional vertebrae : Bertolotti's syndrome. International journal of spine surgery 2015 volume 9 article 42