A RARE CAUSE OF LOW BACK PAIN IN ADULTS: PARS INTERARTICULARIS FRACTURES

Hatice KOSE OZLECE*

Acibadem Kayseri Hospital, Department of Neurology, Kayseri, Turkey

ABSTRACT

Low back pain is a common symptom throughout the world. Pars interarticularis fractures are a rare cause of low back pain. In our study, we aimed to assess the incidence and characteristics of pars interarticularis defects in patients applying with low back pain, accompanied by the literature. In our study, 4537 patients applying with low back pain were retrospectively assessed. The sociodemographic, clinical and radiological characteristics of patients with spondylolysis diagnosis were researched with risk factors and treatment methods. Of 4577 patients, 111 (3.2%) were identified to have pars interarticularis fracture. While spondylolysis was identified in 63 (18%) of 350 patients with spina bifida occulta (SBO), the presence of SBO was determined to increase the rate of spondylolysis by 4.5 times. In 7.2% of patients there was a history of professional sports. Other patients were not determined to have any known risk factors. A rare cause of low back pain, pars interarticularis fracture may develop as a result of minor traumas, contrary to what is known. As a result, it should be recalled for patients with stubborn low back pain and appropriate tests performed with appropriate treatment and exercise programs arranged after diagnosis.

INTRODUCTION

Low back pain is a significant health problem experienced at least once by 80% of the global population, with increasing incidence with age, negatively affecting quality of life, and causing labor loss and disability (1-3). Apart from patients with occupational risk factors, low back pain symptoms are observed at equal rates in male and female genders (4).

Advanced age, occupational tendency, sedentary lifestyle, obesity, smoking, and low socioeconomic level are known risk factors for low back pain (5). The etiology is blamed on pathologies linked to inflammatory, infectious, neoblastic, degenerative, vascular, congenital, psychogenic, vascular and skeletomuscular systems (6).

Lumbar spondylolysis is the situation where the pars interarticularis on the posterior neural arch of the lumbar vertebrae separate with a smooth-edged fracture. It is most commonly observed at L5, less commonly at L4. The etiology is not fully known, but it is considered that hyperextension of the vertebra causes stress fractures. It is observed at rates of 2-5% in the general population, but is more common among individuals involved in sports branches like diving, ballet and gymnastics (7,8). If pars interarticular defects are not recalled as a rare etiologic cause in patients applying with low back pain, it may be difficult to see the pathology on direct radiography. This situation may delay diagnosis and lead to unnecessary tests and mistaken treatment.

In our study we aimed to assess the incidence and features of pars interarticularis defects in patients applying with low back pain, accompanied by the literature.

MATERIAL AND METHOD

Our study retrospectively assessed 4537 patients applying with low back pain to the neurology-neurosurgery clinic of a university hospital from January 2014 to April 2016. Patients with spondylolysis diagnosis had sociodemographic, clinical and radiological characteristics, risk factors and treatment methods researched. Patients with tumor lesions, previous spinal surgery and younger than 18 years were excluded from the study.

Radiologically, the presence of spondylolysis, spondylolithic listhesis and spina bifida occulta (SBO) were noted. Spondylolysis spinal level and degree were assessed with lumbar computed tomography (CT). A hairline fracture is visible in the early stage, it progresses into a gap in the progressive stage, and the terminal stage defect manifests as pseudoarthrosis. The degree of spondylolisthesis was classified according to the Meyerding classification (9).

RESULTS

Of 4577 patients applying with low back pain, 111 (3.2%) had pars interarticularis fracture identified. Of these patients, 65 (43.04%) were female and 86 (56.96%) were male. The age interval was 18 to 70 years, with mean age of 48.11. Three patients had fracture only on the right, 4 patients only on the left at L5 pars. Bilateral L5 pars fracture was identified in 135 patients, with 9 having bilateral L4 fracture.

Among 350 (7.6%) of 4577 patients, SBO was identified. In the 350 patients with SBO, 63 (18%) had spondylolysis, while 168 (3.9%) of the 4277 patients without SBO had spondylolysis.
DISCUSSION

Spondylolysis is defined as a stress fracture occurring in the pars interarticularis, especially in the childhood and adolescent period (10). In the adolescent spine, growth cartilage areas and immature ossification centers are present (11,12). Ossification progresses from anterior to posterior and in the lower lumbar vertebrae, especially at L5, the upper section of the pars interarticularis may be congenitally missing (13). As a result, stress fractures may occur more commonly in this region. It is observed in 4-6% of the general population. Though the etiology is not fully known, it is commonly accepted that repeated hyperextension movements of the lumbar spine cause stress fractures in the pars interarticularis (6). As a result, it is more commonly observed among people involved in sports branches, especially ballet and wrestling (9). In our study, when patients applying with low back pain were assessed, 3.2% were identified to have pars interarticularis fracture. Only 7.2% of patients had history of professional sports. No patient had history of major trauma. This situation leads to the consideration that, contrary to what is known, minor trauma may be effective in the development of spondylolysis.

Spondylolysis generally occurs on the left side and most commonly at L5 (85-95%) and L4 (5-15%) levels. It rarely forms at upper spinal levels (14). In our study, it was most common at L5 vertebral level and with bilateral occurrence.

Spondylolisthesis is where a vertebra slides ahead of the lower vertebra. It is most commonly observed at L5-S1 vertebrae (11). In our patients, low grade spondylolisthesis was identified, with all patients in this group having bilateral pars fracture. If necessary, surgical treatment may be planned after 6-12 months of conservative treatment of adults with spondylolisthesis identified. All of our patients responded to conservative treatment.

SBO is generally asymptomatic, and is a disease that is coincidentally discovered, but there have been several reports on the relationship between spondylolysis and SBO. Some studies have reported the presence of SBO increases the development rates of spondylolysis by 3-4 times (15,16). In our study, the presence of SBO was identified to cause 4.5 times increase in the incidence of spondylolysis.

Spondylolysis and spondylolisthesis most commonly occur as low back pain complaints. For diagnosis, CT or MR may be useful apart from direct radiography. The first aim of treatment is to create pain-free periods and to shorten the time for return to sports for sportspeople. After diagnosis, treatment initially involves the use of analgesics and myorelaxants and rest is recommended. Additionally, conservative treatment using flexion exercises may be arranged. Activities causing pain, especially like extension, should be avoided. Untreatable, severe chronic low back pain and neurologic symptoms may require surgical treatment (17). In our study, all patients had a pain-free period ensured with conservative treatment, with no situation requiring surgery.

CONCLUSION

Contrary to what is known, pars interarticularis fractures may develop as a result of minor trauma. As a result, it should be recalled for patients with stubborn low back pain and appropriate tests performed. After diagnosis, appropriate treatment and exercise programs should be organized.

Acknowledgments

We wish to thank who contributed to this study, including Orhan Akyüz (patient collection), Mustafa Gok (radyological assessment).

References

Sakai T, Sairyo K, Takao S et al. Incidence of lumbar spondylolysis in the general population in Japan based on multidetector computed tomography scans from two
Yamada A, Sairyo K, Shibuya I et al. Lumbar spondylolysis in juveniles from the same family: a report of three cases and a review of the literature. Case Rep Orthop 2013;272514

How to cite this article:

******