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# CERVICAL SPONDYLOLISTHESIS

KENJI HANAI, TOKUO MIYASHITA & HIDEO SABURI

Department of Orthopaedic Surgery, Nagoya City University Medical School, Kawasumi-Cho, Mizuho-Ku Nagoya, Japan.

A case is reported of cervical spondylolisthesis in a 12-year-old girl. The cervical spondylolisthesis has not progressed in the 2 years of observation.

*Key words:* cervical spondylolisthesis; spina bifida; cervical pain

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Spondylolisthesis is an abnormality that is often seen in the lumbar spine. It is rare to find it in the cervical region although congenital abnormalities of the cervical spine are often observed. The anomaly consists of bilateral defects in the interarticular portions of the vertebral arch (i.e., bilateral spondylolysis) with consequent slipping of the corresponding vertebral body. The condition was first described by Perlman & Hawes in 1951. Subsequent case reports have been presented by several authors (Kau 1954, Schlüter 1956, Durbin 1956, Lissner, Csákány & Álmos 1959, Niemeyer & Penning 1963, Wiedhopf 1965, Isobe et al. 1966). In this case report cervical spondylolisthesis of a 12-year-old girl is described.

## CASE REPORT

A 12-year-old school girl who had no history of an accident complained of pain in the cervical region and the right arm. The pain became accentuated by holding the same posture for a long time. On neurological examination, no abnormality was found. There was no limitation of movement nor was there any radiation of the pain into the thoracic area, into the shoulders and arms, or into the hands. Roentgenograms (Figures 1-A, 1-B, 1-C) were taken in the anteroposterior, lateral and both oblique projections of the cervical spine. The sixth cervical vertebra and the superincumbent vertebrae were displaced forward on the posterior arch of the sixth cervical vertebra and on the seventh cervical vertebra. At this level there was an increase of the cervical lordosis. The defects appeared to be in the pedicles of the sixth cervical vertebra. The articular pillars of the sixth cervical vertebra were underdeveloped and had become shorter in length, and the articular pillars of the fifth cervical vertebra were not fully developed. There was a spina bifida of the sixth cervical vertebra. To determine the instability of the patient's cervical spine, a functional roentgenographic investigation was carried out using the technique

*Table 1. The angle of mobility of the cervical spine.*

| | 1972.9 | 1974.9 | Zeitler (11–14 y.) |
|---|---|---|---|
| C 1/2 | 20° | 25° | |
| C 2/3 | 20° | 15° | 17.5° |
| C 3/4 | 30° | 20° | 25.5° |
| C 4/5 | 25° | 15° | 29.5° |
| C 5/6 | 15° | 25° | 27.5° |
| C 6/7 | 10° | 20° | 23° |

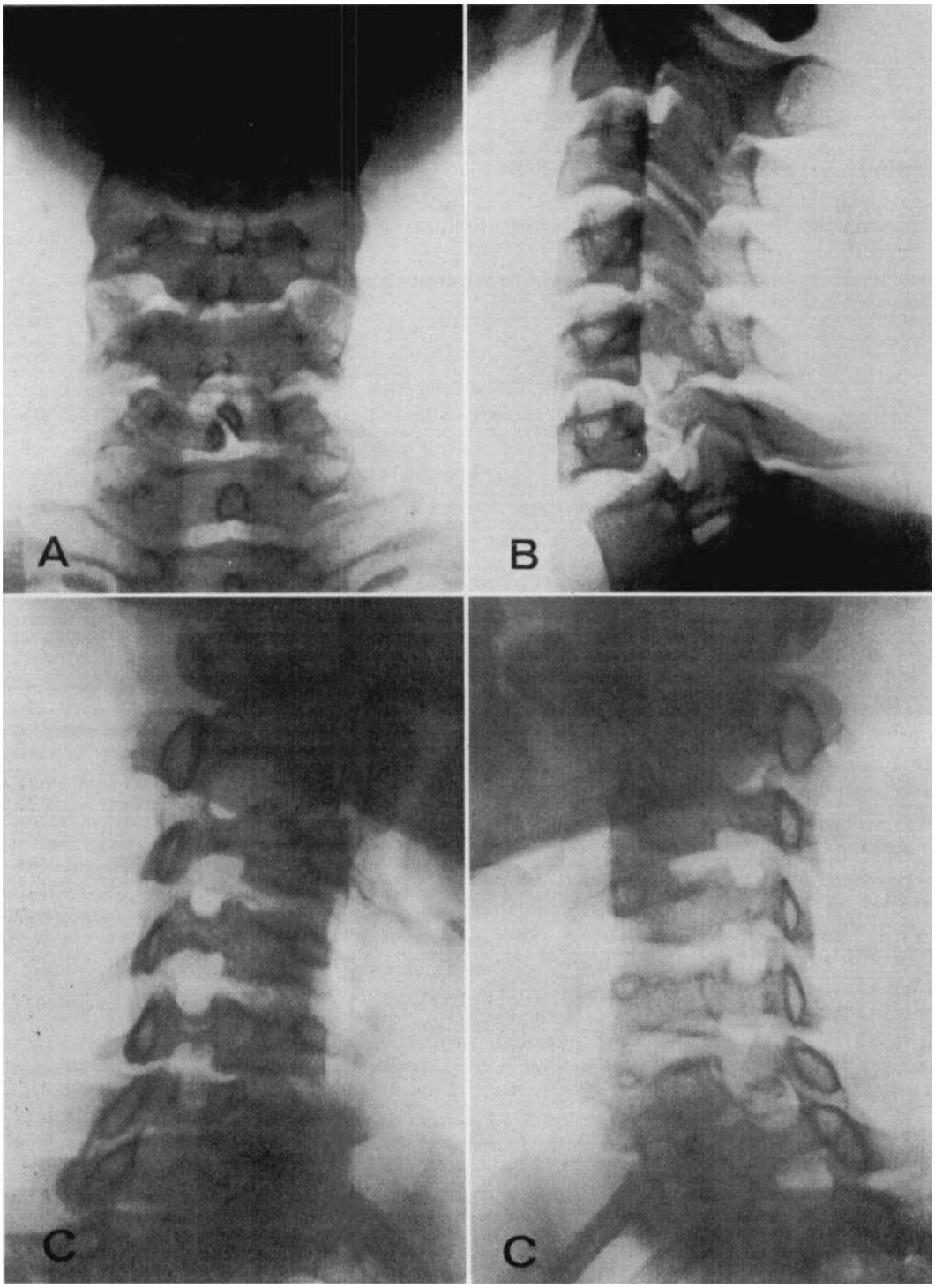
A
B
C
C

*Table 2. The symptoms and X-ray findings in cervical spondylolisthesis.*

| Author and year | Age | Sex | Symptom | X-ray finding | | |
|---|---|---|---|---|---|---|
| | | | | Spondylolysis | Spina bifida | Spondylolisthesis |
| Perlman & Hawes (1951) | 19 | Male | Nuchal pain | C6+ | C6+ | C6/7 |
| Kau (1954) | 8 | Male | Torticollis | C6+ | C6+ | C6/7 |
| Schlüter (1956) | 42 | Male | Cervical pain | C6+ | C6+ | C6/7 |
| | 55 | Male | Nuchal pain | C6+ | C6+ | C6/7 |
| Durbin (1956) | 25 | Male | Cervical pain | C4+ | | C4/5 |
| Lissner (1956) | 42 | Male | Nuchal pain | C5+ | C5+ | |
| | | | | C6+ | | C6/7 |
| Csákány & Álmos (1959) | 41 | Male | Retrosternal pain | C6+ | C6+ | C6/7 |
| Niemeyer & Penning (1963) | 40 | Male | Dysphagia | C6+ | C6+ | C6/7 |
| Wiedhopf (1965) | 17 | Male | Cervical pain | C6+ | C6+ | C6/7 |
| Isobe et al. (1966) | 57 | Male | Shoulder pain | C6+ | C6+ | C6/7 |
| | 33 | Male | Cervical pain | C6+ | C6+ | C6/7 |

of L. Penning. The results of the functional roentgenographic investigation of the patient's spondylolisthetic vertebra are shown in Table 1. The range of movement of the patient's cervical spine seemed to be almost in the normal range with respect to Zeitler's data on the motion of children's cervical spines (Zeitler & Markuske 1962). When discovered, anterolisthesis in the case of the 12-year-old girl was about 3.0 mm. The instability was not apparent in every cervical vertebra. Based on the data obtained, a comfortable collar was designed for the patient. The cervical pain decreased immediately after fixation of the collar. Two years after the first consultation, the patient was examined roentgenographically. The range of movement of the cervical spine is shown in Table 1. The degree of movement of each cervical vertebra is almost the same as that of 2 years previously. Anterolisthesis is about 2.5 mm. From this evidence, it seems that the patient's cervical spondylolisthesis has not progressed.

## DISCUSSION

Eleven cases have been reported in nine publications (Table 2). In all case reports, the cervical spondylolisthesis has been found in men. The sixth cervical vertebra was the region of predilection. According to Hadley (1946), the spondylolysis of the cervical spine was a congenital anomaly of the spine and was induced by developmental disturbance of the cervical laminal arch. Hadley (1946) also suggested that if the symptoms of cervical spondylolysis were more severe, the relative frequency of the disease would be higher. Caffey (1967) mentioned that the cervical spondylolisthesis might be induced by disturbance of the ossification of the neural arches of the cervical vertebrae in the early months of fetal life. Csákány & Álmos (1959) named the cervical spondylolisthesis "C6-Symptomen-Komplex". In that case it was accompanied by spina bifida of the sixth cervical vertebra. Treatment or follow-up has been reported for four of the eleven patients in the literature. The treatment in Kau's case (1954) consisted of performing a tenotomy of the sternocleido muscle. For one case in Isobe's report (1966) conservative therapy was administered; in the other case an anterior spine fusion was performed. Niemeyer & Penning (1963) mentioned that functional roentgenographic investigation was

*Figures 1-A, 1-B, 1-C. Anteroposterior, lateral, and oblique roentgenograms of the cervical spine of a 12-year-old school girl with spondylolisthesis and spina bifida of the sixth cervical vertebra. The body of this vertebra shows ventral displacement relative to the seventh cervical vertebra.*

useful for the determination of treatment for the spondylolisthesis.

In their case, the mobility of the spondylolisthetic vertebra was in the range of 10–25 degrees. Because this angle was in the normal range, operative procedure was not used. The mechanism of nuchal pain, or cervical pain, is not clearly understood. In our case, as in Niemeyer's case, abnormal mobility of the vertebra was not apparent. It seems reasonable to assume that the cervical pain may be caused by abnormal strain on the vertebral body or by abnormal motion in the pedicles. Neurological symptoms have not been cited in any publication. If the anterolisthesis of the spondylolisthetic vertebra exceeds a certain limit, neurological symptoms must occur. In all reported papers the anterolistheses were within 3.0 mm. It is supposed that the anterior ligament complex protects against anterolisthesis of the vertebral body.

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Correspondence to: Kenji Hanai, Department of Orthopaedic Surgery, Nagoya City University Medical School, Kawasumi-cho, Mizuho-Ku Nagoya, Japan.