

THE PREVALENCE AND DISTRIBUTION OF DYSPLASTIC AND FULLY CORTICALIZED PEDICLES IN ADOLESCENT IDIOPATHIC SCOLIOSIS (AIS) PATIENTS WITH MAJOR THORACIC CURVES

Chee Kidd Chiu, Wee Jieh Wang, Weng Hong Chung, Chris Yin Wei Chan, Mun Keong Kwan

Department of Orthopaedic Surgery, National Orthopaedic Centre of Excellence for Research and Learning (NOCERAL), Faculty of Medicine, Universiti Malaya, Kuala Lumpur, Malaysia

Background:

The knowledge on the prevalence and distribution of dysplastic and fully corticalized pedicles in AIS patients is important.

Objective:

This study investigated the prevalence and distribution of dysplastic and fully corticalized pedicles in AIS patients with major thoracic curves.

Materials and methods:

6494 pedicles from 249 patients were retrospectively reviewed. Pedicles were classified into 4 grades: (A) cancellous channel of >4 mm; (B) cancellous channel of 2 to 4 mm; (C) cancellous channel of <2 mm or corticalized pedicle of >4 mm; (D) corticalized pedicle of ≤ 4 mm. Grades B, C and D were considered dysplastic pedicles and grade C and D were considered narrow-dysplastic pedicles. Fully corticalized pedicles were grade C with corticalized pedicle of >4 mm and grade D.

Results:

Narrowest pedicle was at right T4 (2.3 ± 1.0 mm) and the widest pedicle was at left L5 (13.4 ± 2.3 mm). The narrowest transverse cancellous pedicle width was located at right T4 (1.5 ± 0.8 mm) and the widest cancellous pedicle width was located at left L5 (11.7 ± 2.3 mm). Prevalence of dysplastic pedicles was 61.7%. There were 22.6% narrow dysplastic pedicles and 4.1% fully corticalized pedicles. Higher prevalence of narrow dysplastic and fully corticalized pedicles were found over right T3-T5 pedicles and left T6-T8 pedicles. There was a transition from larger and less dysplastic pedicles at T11 and T12 vertebrae to higher number of narrow dysplastic pedicles at L1 and L2 vertebrae.

Conclusions:

Pedicles were narrower at the right proximal thoracic concavity and at the left main thoracic concavity. Transition from larger and less dysplastic pedicles to smaller and more dysplastic pedicles was found at the thoracolumbar junction. Prevalence of dysplastic pedicles was 61.7%, narrow dysplastic was 22.6% and fully corticalized was 4.1%.