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Treatment Analysis of 49 Cases with Pedicle Fractures of the C2 Axis

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Background: Due to distinct anatomical features of the C2 pedicle, spine surgeons often do not understand the exact location of the C2 pedicle and confuse C2 pedicle fracture with pars interarticularis fracture. As a result, little information is available about the characteristics and treatment strategy for a C2 pedicle fracture.

Research question: We sought to investigate the characteristics of C2 pedicle fractures (PFs) and to propose an appropriate treatment strategy.

Design: Retrospective case series

Methods: A total of 49 patients with C2 PFs were included in this study. We divided these patients into unilateral and bilateral C2 PF groups. The incidence rates and characteristics of other associated C2 and C2-3 injuries, and other cervical injuries, were evaluated. In addition, treatment methods and outcomes were analyzed.

Results: 22 patients had unilateral C2 PFs and 29 patients had bilateral C2 PFs. Among the cases of unilateral C2 PFs, all patients had one or more other C2 fractures, and 20 patients (90.9%) had one or two C2 body fractures. Meanwhile, among the cases of bilateral C2 PF, all patients had two or more other C2 fractures and one or two C2 body fractures. In unilateral C2 PFs, 3 patients with C2-3 anterior slip or adjacent cervical spine (C1-3) injury underwent surgery and 19 patients (86.4%) were treated with conservative methods. In bilateral C2 PFs, 3 patients with C2-3 anterior slip or SCI at C2-3 underwent surgery and 24 patients (88.9%) were treated with conservative methods.

Discussion: Our results showed that C2 PFs do not occur alone and are always accompanied by other associated C2 injuries. Despite the complex fracture characteristics, most C2 PFs can be managed with conservative treatment. However, surgical treatments should be considered if the C2 PFs are accompanied by the C2-3 anterior slip and adjacent cervical spine injury.