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Special Paper

Retrieving Polyaxial Tulip-head Pedicle Screws in Revision Spine Surgery: A Technical Note

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ABSTRACT

Background and Aim: Tulip-head screws are among the many implant systems developed with advances in spinal surgery. A screw is retrieved during revision spine surgery to be replaced with a larger diameter screw or before different types of osteotomies. This study aims to provide a simple and practical method to retrieve tulip-head screws during revision spine surgery or implant removal.

Methods and Materials/Patients: We provide a step-by-step description of the technique, which requires only an Allen wrench, an anti-torque wrench, and a one-inch rod. The technique is easily and routinely applied in revision spine surgery to retrieve tulip-head screws without any complications.

Conclusion: Our method is a simple and practical way to remove tulip-head polyaxial screws.

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1. Introduction

Annually, more and more fusion spine surgeries are performed, which leads to a higher number of implant removal and revision procedures [1, 2]. Tulip-head screws, are among the many implant systems developed with advances in spinal surgery. Removing hardware can be quite a challenge, especially when screwdrivers are mismatched or implant sets are no longer available. If the proper screwdriver is not available, removing polyaxial screws can be extremely difficult because the tulip-head component rotates independently of the screw shaft. We propose a simple and practical method for retrieving tulip-head pedicle screws during revision spine surgery or implant removal.

2. Methods and Materials/Patients

Technical note

An Allen key (hex-head wrench), an anti-torque wrench, and a one-inch-long rod are required for our technique. An Allen key is used to remove nuts from screws or connectors when a proper screwdriver is not available. A one-inch rod is short enough to avoid causing damage to the surrounding structures. The rod is inserted into the tulip of the screw and tightened with a nut so that the screw head moves as a single unit (Figure 1A). Then, the rod is turned counterclockwise with an anti-torque wrench to remove the pedicle screw (Figures 1B and 1C). The local Ethics Committee waived ethical approval because all procedures were part of routine care, and no identifying information about participants is available in the article. Using this simple and practical method, we were successful in removing tulip-head pedicle screws from patients undergoing revision spine surgery or implant removal (Figure 2). This procedure did not result in any complications.

3. Discussion

Spinal transpedicular screw fixation is a widely used spinal fixation technique for a wide range of spinal disorders. As the number of procedures performed grows each year, so does the need for these implants to be removed [2]. Some implant systems are only used for a limited time, and their use or import may cease after

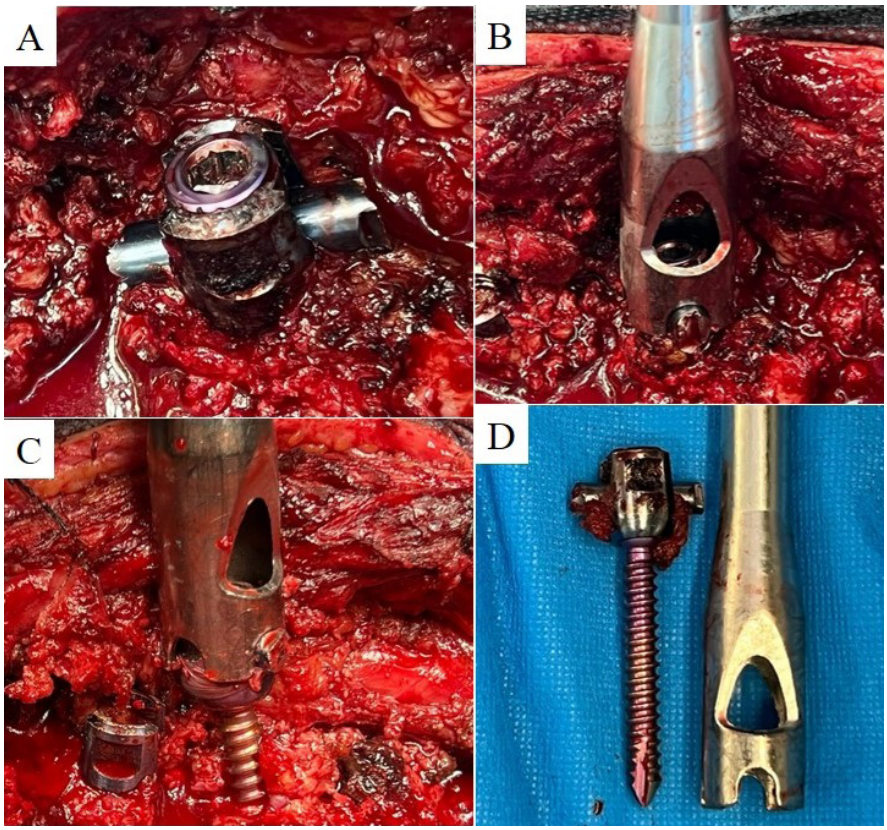

Figure 1. A step-by-step description of the technique

A) A one-inch rod is inserted into the tulip of the pedicle screw, and the nut is tightened with an Allen wrench, B & C) The rod–screw complex is then rotated counterclockwise with the use of an anti-torque wrench, D) The screw-rod complex is then easily removed

Figure 2. Preoperative (left) and postoperative (right) radiographs of a revision spinal surgery in which this technique was used successfully to retrieve screws

a certain period. For the removal of tulip-head pedicle screws, we recommend using our simple method, which requires only an anti-torque wrench, an Allen wrench, and a one-inch rod.

4. Conclusion

Our simple and practical method helps retrieve polyaxial tulip-head pedicle screws during revision spine surgery to be replaced with a larger diameter screw or before different types of osteotomies.

Ethical Considerations

Compliance with ethical guidelines

Ethical approval was waived by the local Ethics Committee of the Hospital given the retrospective nature of the study and all the procedures were part of the routine care. There is no information (names, initials, hospital identification numbers, or photographs) in the submitted manuscript that can be used to identify patients.

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Authors' contributions

Conceptualization, methodology and supervision: Abolfazl Rahimizadeh; Investigation and writing: All authors.

Conflict of interest

The authors declared no conflict of interest.

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