Innovations
UNIVERSITY OF COLORADO
ANSCHUTZ MEDICAL CAMPUS

Novel "Half-Hole" Screw-Plate Interface

Product

Anterior cervical plating system

Indication

Anterior cervical discectomy and fusion

Value Propositions

- Allows placement of plates much closer to a joint without interfering with joint function
- Decreased risk of ALO

Market

- $9.35 billion—Global spinal surgery devices market (4.5% CAGR 2021-2026)

Intellectual Property

- US Patent No. 10,786,289*
- Available for licensing

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Background on CU3210H

Bone fractures and spinal fusions often require plate and screw fixation for rigidly holding the bones in place while healing for a bone fusion. With fractures that are close to a joint or spine fusions in the neck, it is ideal to keep the plate as far from the articulation of the joint as possible. This can, however, be difficult with standard plates because of the structural metal support needed around the screw hole. A new plate system that allows for a screw hole that only has to go ¾ of the way around the screw has been developed to solve this problem. It has been applied to cervical plates and can similarly be used in fracture periarticular-plates.

ACDF (anterior cervical discectomy and fusion) is used to treat a number of indications related to the cervical spine, including radiculopathy, degenerative disc disease, herniated disks, stenosis, and fractures. It is one of the most common spine surgeries performed in the US. About 137,000 ACDF surgeries are performed every year, with an estimated 36,000 in the US alone. In ACDF, a cervical plate is screwed into vertebrae above and below following the removal of faulty disc and insertion of spacers. Although the success rate of the surgery is high, adjacent-level ossification (ALO) has been observed in 29% of patients. ALO, over time, degenerates nearby discs, reduces range of motion, and increases likelihood of patient needing another surgery down the line. ALO is often an unintended consequence of the size and difficulty of aligning traditional cervical plates. Therefore, there is a demand for an improved system and methods for positioning two or more interacting elements relative to one another for use in applications such as ADCF.

Technical Innovation

Dr. Vikas Patel has created a new anterior cervical plating system for ADCF that overcomes limits of the current standard of care options. Dr. Patel's half-hole technology eliminates the extra material at the screw end of the cervical plate, giving the device an optimal, low-profile shape that does not encroach on adjacent levels while maintaining the same if not more, stability as traditional plates. The screw angles can be variable, and screws can be set *before* placing the plate, making alignment in the OR simple and accurate. Additionally, the design allows for stackability of single plates, further increasing the accessibility of the device by making multi-level procedures much more straightforward. This new plate with half-hole technology has combined all the benefits of current options without creating unintended consequences for patients and has the potential to transform anterior cervical discectomy and fusion procedures.

Figure: Representative illustration of the "half-hole" surgical plate with fastener and screw assemblies

**US Patent: 10,786,289*—"SYSTEM AND METHODS FOR POSITIONING OF TWO OR MORE INTERACTING ELEMENTS"- *Issued September 29th, 2020.*