SPINAL FUSION WITH THE KLUGER TRANSPEDICULAR FIXATION SYSTEM PRELIMINARY REPORT

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The posterior segmental fixation system gives adequate stability in unstable spinal disorders such as degenerative instabilities, fractures, spnodylolisthesis and tumors.

Roy Camlle was the one who introduced the pedicular screw fixation.

We reviewed 30 cases operated with the Kluger Transpedicular Fixation System with gool relief of pain and without major complaints.

The follow up varied from 2-30 months.

The Kluger system is a good system for a short traject fixation, it is not so bulky like other systmes. The indication is very important for the end-result.

***Key Words** : Fixateur interne, posterior spine surgery, pedicle fixation, spinal fracture, spinal deformity.*

King and Boucher described the technique of vertebral bonescrcwing consisting of oblique transfacet srewing, coupled with grafting of bone taken from the facets and laminae.

Roy Camille introduced plates with transpcdicular fixation for stabilising the thoracic and lumbarspinc in 1963. The screws were driven parallel'to the sagittal plane and into the articular processes later on Louis and Maresca modified the material and technique. The solutions incorporating transpcdicular fixation offer a much higher degree of stability than that obtained with the Harrington system. A lot Transpcdicular Fixation systems have been developed. We have chosen for the Kluger Transpcdicular Fixation System.

The following report is a review of our experience with this system in fusion of the thoracic and lumbar spine during the past 3 years for different indications.

MATERIAL AND METHODS

In the period from 1986 to 1989 thirty patients were operated with the Kluger Transpcdicular Fixation System. In this serie we had 16 women and 14 male.

Indications were listed in table I:

Spondylolisthesis 5, degenerative discdisease 6, fractures 9, posldisceclomysyndromc 6, postchemosyndrome 2, tumors 2.

Three patients had already undergone an anterior procedure before the transpcdicular fixation. The number of levels that was instrumented varied from two to five, three levels fusion occurred mostly. The follow up varied from 2-30 months and the mean was 12 months.

The postoperative immobilisation was in 20 patients in a plaster of Paris and in 10 patients a brace.

Image intensifier controle is imperative during this procedure due to the possibility of invading the spinal canal or intcrvcrtcbral foramen and penetrating the anterior cortex of the vertebral body.

The patient is placed in a knee chest position, in this position the intra abdominal pressure is decreased.

A midline incision is made over the spinous processes. The paraspinal muscles detached and freed to the outer margin of the tranversc processes.

The entry point is located for the thoracic spine at the lower edge of the facet joint 3 mm lateral to the midline of the joint.

In the lumbar spine the entry point is at the lateral border of the superior, articular process, on the midline of the transverse process.

Pedicle awl is used to initiate the entry hole. Pedicle probe is used to enter vertebral body. Depth gauge to determine the length of the screw.

Dcpt gauge to palpate the pedicle hole.

The proper screws or pins are placed in the vertebrae, this happens with special rods which are fixed on the heads of the screws. A specific device can be fixed to the rods, in this way, compression, distraction, kyphosis and lordosis can be easily influenced. There is also a special device to measure the length and the rotation of the telescoping bar that is be needed.

Telescoping bar is placed and fixed with a small screw or pin.

Before instrumentation is done, it is esscntiel to decorticate the laminea and the processes transversus, after the instrumentation is done bone chips are placed

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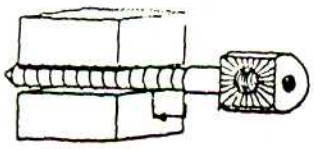
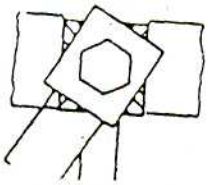
on the decorticated places. In fractures transpedicular vertebral bone grafting is done. Before closing the wound AP and lateral view is done with the image intensifier to be sure that the screws arc correct placed.

Srews



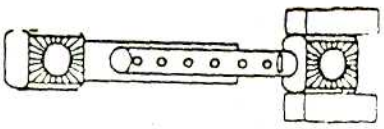
Thread diametre	5mm
Head diametre	11,4 mm
Head height	12 mm
Length under head	40 to 75 mm
The pin has a self taping thread diametre 5 mm.	

Radial teeth on the pin head allow a 60° position orientation of the union bar every 6°



Pin / union bar junction.

Telescopic Union Bars



- The tube component has an outside diameter of 8,2 mm.
- The bar component has an outside diameter of 7 mm.

These bars are adjustable to the length between the implanted pins. 4 sizes are available "which allow a setting range from 37 mm to 130 mm distance between pins.

This system of telescopic bars allow a free orientation and length setting to correspondant exactly to the pins pasition.

The union bars are set in position by was of crimping. There is also an union bolt.

Suture retracted musculature over the implant and close the wound.

Patients were allowed to rise with the help of a physiotherapist the fourth day after surgery, most of them left the hospital within 14 days.

Patients wore braces or plaster of Paris most of the time during 3 months. Systematic evaluation were done which included AP and lateral radiographs.

RESULTS

Pain, clinical findings (i.e., neurological symptoms and flexibility of the lumbar spine), radiological findings, and rehabilitation were taken into consideration. A point system was used to value the above mentioned criteria.

14 patients (45%) very good, 11 patients (37%) good, satifactory 2 patients (7%) one patient unsatisfactory (%3), 2 patients were bad (7%).

Two patients required re-operation, the reason was pain in one and root irritation in another, after the operation the problems were solved.

The complications we have had with this procedure were : malaligment screw I, and neurological problems two (root irritation), 1 patient was rcopcratcd and the problem was solved. The other patients did not want another operation, his back problem he had before the operation was solved. He had a mild irritation of the rood of SI.

DISCUSSION

Until 1986 we did spine fusions with and without additional instrumentation, the systems we have used for different indications were the Slot-Zielke system the Harrington rod, Luquie rods and the rectangle.

In patients with spondylolisthcsis or degenerative discdiscascs most of the time we did an anterior artrodcsis without instrumentation or postero-latcral anthrodesis. The after treatment was six to twelve weeks bcdrcsl in a plaster of Paris, very inconvenient for the patient. The posterior fixation systems based on the Harrington Rod or its modifications, require at least four segment instrumentations to maintain reduction and achieve stability. Instrument failure and loss of correction has become a significant problem in most systems.

A stable internal fixation combined with the posterior of postero-lateral graft must improve the rate of succes of arthrodesis, it is also very important that the arthrodesis done can be limited to the area of pathology.

The disadvantge of the Harrington rod and its modifications described above and the inconvenience for the patients made up our mind to find a better system.

We have chosen for the Kluger Pedicular Fixation system because it seemed to us a stable system and was not so bulky like other systems.

With this system distraction, compression and rotation enabled restoration of the normal anatomy, minimizes number of immobilized segments preserve mobility. We compared our results of the anterior intercorporal fusions and the postcro lateral fusions with these of fusions done with The Transpedicular system.

The result of the last were for greater.

In cases were you have to do a wide laminectomy and decompression you can get now with this system a very stable situation. Fusions for the lumbar spine for pain remains a controlversial topic.

Summarising we can say that the advantages of the Kluger Transpedicular Fixation system we have used arc : stable internal fixation,

Arthrodesis limited to the area of pathology,

Better results of arlhrodcss with transpedicular system,

Last but not least the after treatment is for the patient much more convenient. The Klugcr system is a good system for a short traject fixation, it is not sa bulky like other systems. The indication is very important for the end-result.

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