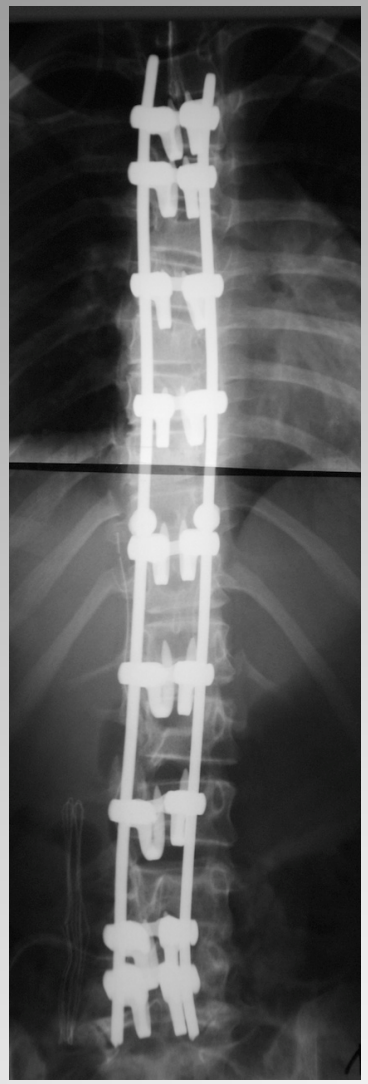
A Novel Infralaminar Hook And Rod System For Correction Surgeries In Idiopathic Scoliosis



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Introduction

Using pedicle screw and rod system dorsal instrumentation in patients with idiopathic scoliosis is technically demanding and accompanied by certain risks.

This is especially true for the dysplastic pedicles at the concave side.

In general, there is the highest rotational deformity at the concavity

and

the highest risk for pedicle penetration and accidential myelon damage at the same time.

Motivation

Inspired by earlier russian rod and hook systems, a novel infralaminar hook system was designed.

In contrast to the Cotrel-Dubousset system it incorporates a a high grade of rotational stability.

It deploys its rotational stability from the beginning of the correction procedure.

Handling is simple. Intraoperative xray not mandatory.

Approach is smaller and correction procedure easier than with screw/rod systems.

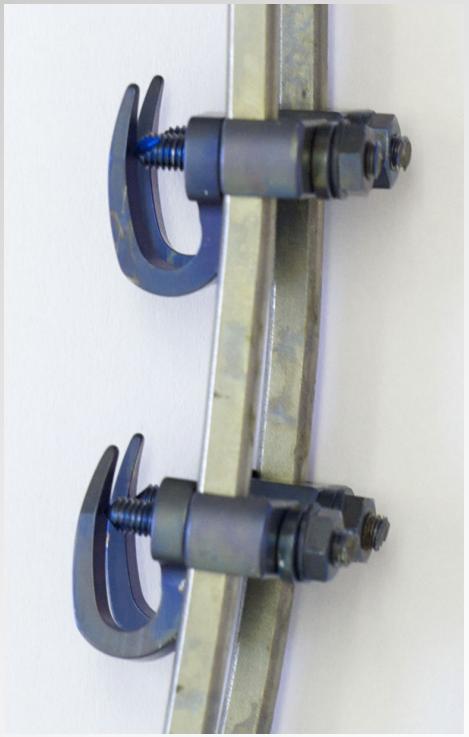
System description / 1

Infralaminar hooks with low intra spinal profile.

Flat rods for rotational stability.

Translaminar fixation to prevent hook dislocation and increase rotational load transfer.

Growth along the rod´s longitude is possible.



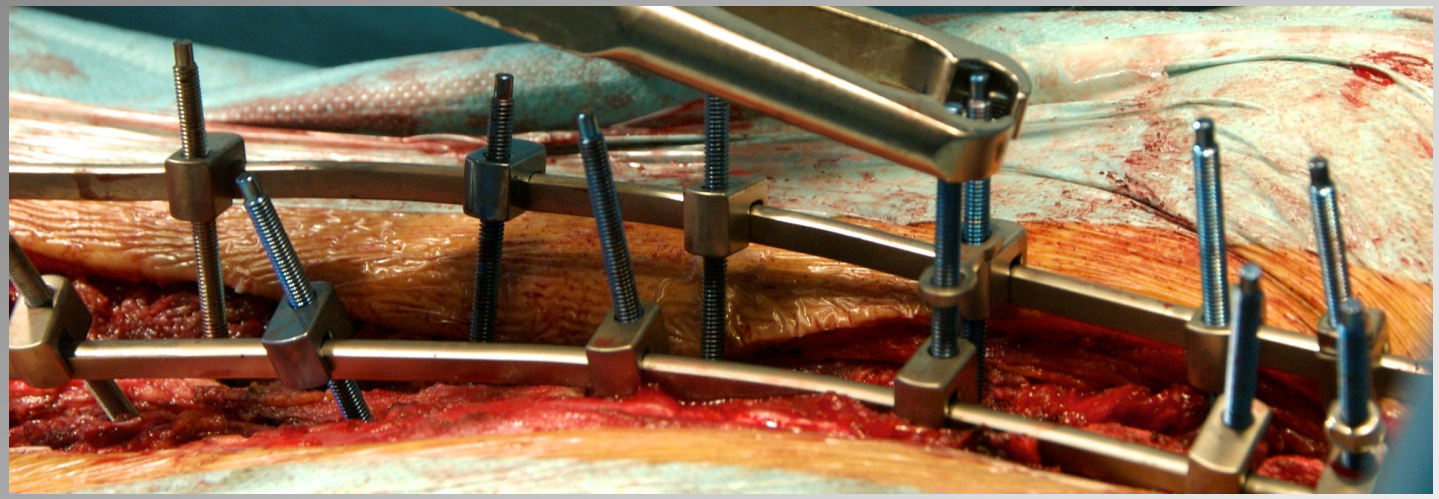
System description / 2

Molded plates for load transfer onto laminae from posterior.

Cross connections for maximum rotational stability and rotational correction.

Drastically reduced number of instruments and implants.

Correction procedure



After hooks and adapted threaded sticks are in place, rods are attached.

Cross connectors are thrown onto the sticks.

The whole connector-rod-system is screwed down for correction according to the rods previously bent by the surgeon.

Clinical data

We overlook a timeframe of this system´s usage in Russia and neighboring countries of a decade beginning in the mid 90´s.

Patients n=1508

Age 6 to 44y (average 15y)

Results were categorised according to the preoperative extent of the scoliosis (Cobb´s method):

	Group 1	Group 2	Group 3	Group 4	Group 5
Scoliotic extent	10° -30°	30° -60°	60° -80°	80° - 100°	100° -
n=	100	652	329	250	177

Results, varia

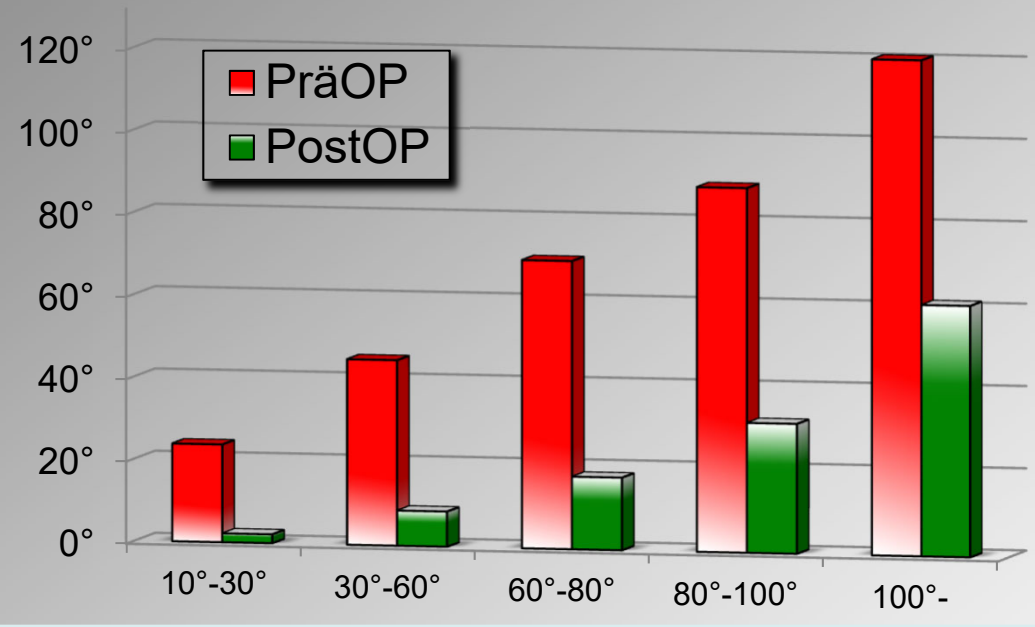
Average time of surgery: 1,5 h

Average blood loss: 700ml

No intraoperative x-ray

Complications:
4% failure of material (production was moved from Russia to Germany after the presented study), 26 cases of wound infections, neurologic complications, 3 deaths.

Results, correction in frontal plane



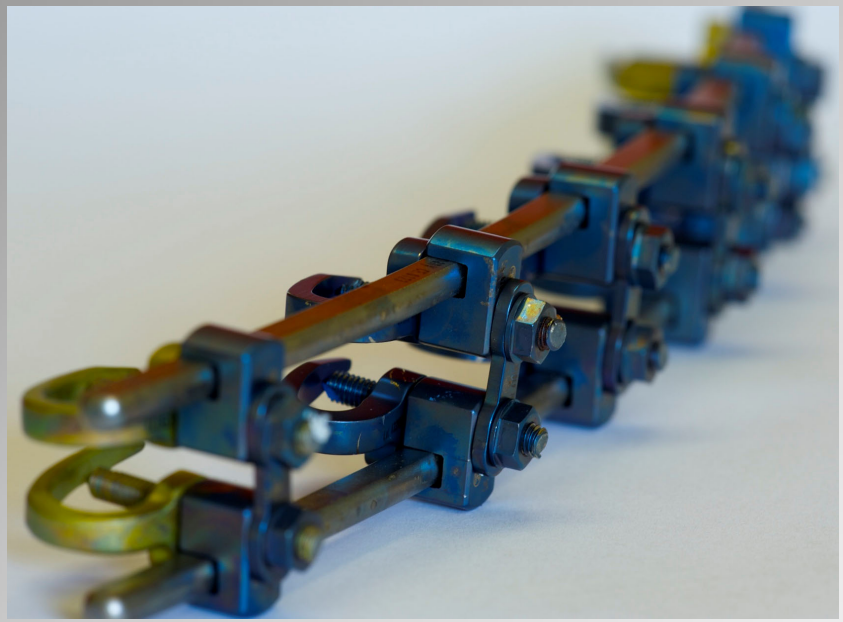
	Group 1	Group 2	Group 3	Group 4	Group 5
Aver. Cobb-angle preOP	24,5°	40,9°	71,9°	86°	114° -
Correction postOP	91,1%	81,1%	74,8%	64,3%	49,4%

Discussion / 1

The presented clinical data needs some revision with respect to King/Lenke classification, sagittal profile and long term results.

But still, the impressive number of treated patients demonstrates the clinical safety and usability.

Discussion / 2



This system proofed its ability to correct ideopathic scoliosis by a fair amount.

It also proofed its superiority over screw/rod and anterior systems concerning simplicity, surgical prerequisites and operation time.