Idiopathic scoliosis
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In a scoliosis the spine is bent to the side and also rotated. This results in body asymmetry, shoulder imbalance and rip hump. In radiographs the spine looks like a «C» or a «S».

The scoliosis develops most commonly during the adolescent growth spurt from 11–18 year of age, and is therefore called adolescent idiopathic scoliosis. A severe scoliosis is more frequent in girls than in boys.

The cause
The cause of idiopathic scoliosis is despite intensive research still unknown. The patients with scoliosis are otherwise healthy. It is probable that a genetic predisposition is present. The genes which are associated with idiopathic scoliosis cannot be identified yet.

Symptoms
The idiopathic scoliosis does not usually cause pain, even though some patients complain of back pain. The cosmetic deformity of the spine, rib hump and shoulder asymmetry are common presenting symptoms.
Operation techniques

Posterior operation
The scoliosis in the thoracic spine is usually operated from the back. A long midline skin incision is placed along the spinous processes. Screws are inserted into individual vertebrae, and the scoliosis as well as rotation of the spine are corrected by means of 2 rods (Fig.1).

Anterior operation
In an anterior operation is the spine exposed from the side. An opening of the chest is necessary for this. The vertebrae and intervertebral discs are directly exposed. After removal of the discs in the region of scoliosis, the vertebrae are fixed with screws and correction of scoliosis is achieved with a rod. The anterior operation is standard for scoliosis in the lumbar region (Fig.2), and also recommended for selected patients with scoliosis in the thoracic region (Fig.3).

The advantages of anterior operation
The scoliosis can be corrected with a short fusion leaving the spine mobile. The scar is short and can easily be covered by underwear (Fig.4).

Treatment

1. Observation
A scoliosis of less than 25° needs to be observed regularly with radiographs till the end of growth.

2. Brace
A brace treatment is recommended for a scoliosis between 25–45° in children with a significant remaining growth (before or during growth spurt). The aim of brace treatment is to prevent a further worsening of scoliosis. A brace cannot correct an existing scoliosis permanently. If the scoliosis remains less than 45° till the end of growth then the brace treatment is considered to be a success.

3. Operation
An operation is necessary if scoliosis progresses to more than 45°.
Neuromonitor

The functions of the spinal cord can be monitored continuously with an apparatus. This reduces the neurological risks of the operation.

Postoperative treatment

The patients can stand on the first day after the operation. A brace or a plaster jacket is not necessary. After an anterior operation a tube to drain the chest is necessary for 2 days. The hospital stay is 5–7 days. Patients can live normally after discharge from hospital. Physiotherapy is not necessary.

School and sport:

Children can go to school after 3–4 weeks. Patients can resume with swimming, cycling after 6 weeks, all other sports after 3 months.
**Operation risks**  
*Following risks apply to all spinal operations generally:*

- Injury of nerves and spinal cord leading to paralysis, numbness, disturbance of bladder and bowel function.  
- Injury of so called sympathetic and parasympathetic nerves can lead to digestive problems, changes in temperature sensation, changes in blood circulation and sweating in extremities, as well as disturbance of sexual function. A disturbance of blood circulation to spinal cord can also lead to all the consequences mentioned above.  
- The overall neurological risk is estimated to be less than 1% in scoliosis operations.  
- Chronic pain, breakage or loosening of implants, infection, and failure of bony healing also belong to the risks.
Prof. Dr. med. Kan Min
Swiss Scoliosis
Centre for spinal and scoliosis surgery

Klinik Im Park, Seestrasse 220
CH-8027 Zürich
Telefon +41 44 209 24 40
Fax +41 44 209 24 41
info@swiss-scoliosis.ch
www.swiss-scoliosis.ch