

# COMPLICATIONS IN SCOLIOSIS SURGERY

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## ABSTRACT:

In this study, the complications which were seen in patients operated for scoliosis in 1993 were evaluated.

All patients were operated by a single surgeon.

Instrumentation was used on 73 cases.

On 21 of 76 cases (27.6%) various complications were seen. All complications except in one case with a cauda equina lesion were recovered completely without sequelae.

The high ratio of complications even in a highly specialised center revealed again that spinal surgery must be performed by experienced surgeons under suitable conditions.

**Key Words :** Scoliosis, complications.

## INTRODUCTION

The management of spinal deformities is a challenge to the spine surgeon and corrective spinal surgery is a major undertaking. Although there have been significant advances and development of new techniques, pitfalls and complications from treatment of these spinal deformities continue to stay with us today.

In this study, the complications which were observed in the patients operated for scoliosis in the Spinal Unit of Institut Calot in 1993 were evaluated retrospectively.

## MATERIAL and METHOD

76 patients were operated for scoliosis at the Spinal Surgery Unit of Institut Calot (Berck-sur-mer, France) between January and December 1993.

43 patients were females, 33 were males.

Average age of patients was 26.5 (6-68).

39 of the patients were adults and 37 of them were children and adolescents.

Etiologic classification of patients:

Idiopathic.....	36 patients
Congenital.....	4
Neurologic.....	10
Neurofibromatosis.....	2
Marfan.....	4
Myopathic.....	2
Degenerative.....	13
Others.....	5
-Achondroplasia.....	1
-Cranial disostosis.....	1

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- RA .....1
- Trisomia 16 .....1
- Arthrogriposis .....1

All patients were operated by the same surgeon (D.Chopin MD.)

Anterior approach was used in 13 cases. Instrumentation was used for 73 patients; the remaining 3 patients were operated without implants. CD system was used for 46 patients; for remaining 27 patients, Colorado system was preferred.

For all patients, a regular pulmonary rehabilitation program has been used. For the patients who have their vital capacity below 40%, the operation was delayed in order to apply an intensive respiratory rehabilitation program.

On the first postoperative day, all patients were allowed to walk. Low molecular weight heparin was used to allow thromboembolus prophylaxis. The prophylactic antibiotics (2<sup>nd</sup> generation cephalosporins) were used till the removal of all drains (24-48 hours for vacuum drains and for thoracic drains till the amount of fluid is below 50cc/24 hours). If any microorganism was detected on the microbiological investigation during drain removal, the use of antibiotics was not discontinued.

Autogenous bone graft was generally preferred, but for adolescent idiopathic scoliosis the triosides also were used. No bank allograft was used.

During all surgical procedures hypotensive anesthesia was used (systolic blood pressure  $\geq$  70mm Hg). Cell saver and auto-transfusion were also used for each case.

The samatosensory evoked potential curves were checked before and after correction maneuvers and the correction was reduced if necessary.

The patients were allowed to swim at 6 weeks postoperatively and to bicycle at 12 weeks postoperatively. In 21 of 76 cases, various complications were seen.

**RESULTS**

The complications observed in all cases can be divided into three groups (8).

**1-Medical Complications:**

- Thrombophlebitis .....1
- Empyema.....1
- Intraoperative bradiarrhythmia.....1
- Urinary tract infection.....1
- Hypothermia .....1
- GIS bleeding.....1

**2-Surgical complications:**

**a-Neurologic complications:**

- Loss of right patellar tendon reflex .....1  
(spontaneously recovered)
- Monoplegia of lower extremities.....2  
(spontaneously recovered)
- Hypoesthesia in L2-3 .....1  
(spontaneously recovered )
- Cauda equina syndrome .....1  
(partially reversible)

**b-Wound complications:**

- Apical skin lesions .....2  
(1 needed surgical debridement)

**3-Late complications:**

- Painful bursitis over implants .....5  
(all needed removal of implants)
- Implant failure of dislodgment .....4
- Pseudoarthrosis.....3

## DISCUSSION

Knowing the complications that may occur in the treatment of scoliosis is fundamental for those physicians who treat these deformities. Ignoring their possible existence means taking the risk of having such complications; on the contrary, respecting them has helped to avoid them (6).

Thrombophlebitis, one of the general medical complications was seen in one patient's (1.3%) right femoral-vein in spite of routine prophylaxis and recovered with medical treatment. As stated in the literature, it is rarely seen in neurologically intact patients (3,9,11).

Only one patient (1.3%) had empyema after anterior approach. In this patient, thoracic tube was removed a little late due to pleural effusion which lasted for a long time. In spite of prophylaxis, a staphylococcus germ was identified at thoracic drain; it was treated with appropriate antibiotics.

Intraoperative bradycardia was encountered in one patient (1.3%) who had myopathic scoliosis and for this reason the operation was discontinued. Bleeding problems which were unexplained with the hematologic parameters were also seen frequently in the patient group which are not included in this study (D.Chopin personnel communication).

Urinary tract infection was appeared in one patient (1.3%) and treated uneventfully with appropriate antibiotics. Hypothermia and GIS bleeding were seen as a complication, each in one patient (1.3%). All of those complications were stated in various ratios in similar studies (3,4,6,7).

The neurologic complications due to surgery were seen in 5 cases (6.5%). Four of them were assessed as incomplete root lesions and the

patients were observed without removal of implants. All patients were recovered without sequelae. Although all implants were removed, the patient who had cauda equina lesion, was not completely recovered (after three months of follow-up). Spinal cord monitoring was routinely performed during surgical procedures (1,2,5). The SEP curves were recorded at the beginning of surgery, before and after correction maneuvers, but all neurologic lesions could not be prevented. This probably due to inefficacy of the monitoring to detect root lesions. Two patients whom SEP curves were deteriorated after correction had no neurologic deficit after reducing the correction.

Another complication related to surgery was skin necrosis in two patients at the apex of kyphoscoliosis. One of these patients underwent surgical debridement. Generally in spinal surgery skin problems were seen at the lower end of wound due to skin retractors, but in these two patients the problem was at the apex because of prolonged bedrest in supine position.

Painful bursitis was seen in 5 cases (6.5%). In three of these patients, at the concave side of the curve, short rod-long rod method was used and bursitis was seen over the short rod. In 1 patient, bursitis was seen over lumbar laminar hooks and in other one, it was over the concave rod which was irritated medial margin of scapula.

Implant failure and dislodgment were seen in 4 cases (5.2%). Implant failure was occurred after first postoperative year. At the same time, pseudoarthrosis has occurred in three of those patients. All pseudoarthrosis were at lower lumbar levels; on the contrary of previous studies, no lumbosacral pseudoarthrosis was seen in this study. The principal reason for this fact was perfect decortication of sacral alae during surgical

procedure and use of copious bone graft to obtain fusion in this area. For the remaining patients (1.3%), complete fusion has occurred. Implant failure was seen in two patients (1 rod, 1 sacral screw), while hook dislodgment has occurred in two cases at lumbar levels. Nowadays, only pedicular screws are used in lumbar area.

If there was a deviation more than 2.5 cm at midsacral line on frontal plane, it was accepted as a decompensation. No frontal plane malalignment was seen (8,10). As known by all obtaining frontal plane balance depends completely on the experience of the surgeon.

### CONCLUSION

The ratio of general complications in 76 patients is 27.6%. In exception of cauda equina lesion, none of the complications had long term sequelae. Even in the Institut Calot which is internationally reputable on spinal surgery, the relatively high ratio of complications compared to others subspecialty of orthopaedic surgery is crucial. There is a wide spectrum of complications and without preventive measures they may become very hazardous. On the other hand, in the presence of scoliosis with conjunction of unexplained syndromes or diseases, there is always a potential to deal with an unexpected situation. For this reasons, it is revealed once again that, spinal surgery must be performed by an experienced team and under suitable conditions.

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