



Clinical evaluation of treatment results after internal transpedicular fixation in patients with idiopathic scoliosis of different severity

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Received: 16.08.2011

Accepted: 05.10.2011

Published: 27.11.2012

Original article/Artykuł oryginalny

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Summary

Treatment outcomes were studied in 45 patients with scoliosis of various severity that were treated with the system of internal transpedicular fixation (Vertebra Stabilization System R 5,5-6,35) OIM (Turkey). The results showed that there was no loss of correction one year after surgery. Long-term follow ups were studied by clinical, radiological and questionnaire assessments. All the patients were satisfied with cosmetic and functional outcomes.

Key words: scoliosis, internal transpedicular fixation

STATISTIC STATYSTYKA

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INTRODUCTION

Spinal deformities are still one of the most common pathologies in children and juveniles. In spite of the fact that spine surgery is passing through the peak of its development as an independent science, currently the problem is aggravated by untimely diagnostics, improper selection of treatment techniques and large financial burden of treatment and social rehabilitation [1] (E.V. Ulrich, 2002). Idiopathic scoliosis incidence reaches 80-85% of all diagnosed scoliosis cases and the total number of the cases with deformity exceeding 10° ranges from 1,5 to 3% of population [2; 3; 4] (M.G. Dudin et al., 2006; P. Smyrnis. et al., 2009; K.C. Soultanis et al., 2007). Scoliosis incidence is 0,04 for 1000 applicants rate of the spinal pathology in adult and up to 18.2% is observed during examination [5] (N.G. Fomichev, M.Ř. Sadovoy, 2004). Different severity of scoliosis is diagnosed in 50% of working population [6] (M.V. Mikhailovsky, 2004). Therefore, the development of scoliosis treatment techniques is one of most important tasks of orthopaedic and spinal surgery. Transpedicular spine fixation rapidly developing and actively applying in clinical practice for the last decade, is one of the up-to-date technique for scoliosis management [7; 8; 9; 10; 11; 12] (M.A. Asher, 2006; J. Dubousset, 2005; Kuklo, L.G. Lenke, 2005; M. Di Silvestre, 2008; O. Karatoprak, 2008 et al.). Nevertheless, constant improvement of the method requires the grounds for applied techniques and late follow-ups study.

MATERIALS AND METHOD OF THE STUDY

The work is based on the analysis operative treatment 75 patients with idiopathic scoliosis of different severity of H. Tusi Clinic Baku, Azerbaijan, within 2006-2010. The system of internal transpedicular fixation (Vertebra Stabilization System Ř 5,5-6,35) made by OIM company was used for operative treatment. Late follow-up were studied by questionnaire poll in 53 cases which made up 70,7%. In 45 cases (60%) late follow-up was studied at on-site consultation. The patients were examined in one year and more after operation. We evaluated the appearance of the patients, made their photos, took X-rays, and studied the character and location of the pain sensations.

RESULTS OF THE STUDY

The loss of correction was not observed in any patient and no breakage of the half-pins and screws was noted. The valuation of cosmetic result slightly changed in comparison with the immediate follow-up (Table 1).

The number of patients with very good results slightly (for 3,5%) increased, the same with good decreased for 4 % and the number of cases with satisfactory outcome increased by 0,4%.

In one year and later the number of patients with thoracic and lumbar pain became less for 2-3 cases in each group comparing with the previous follow-up period (6 months) (Table 2).

The situation with irradiating pain changed as well. In a year after treatment the patients practically did not

Tab. 1. Distribution of the patients according to their satisfaction with cosmetic late follow-up

Satisfaction with cosmetic result	Number of patients (n =45)	
	In absolute numbers	In % to the total number
Very good	22	48,9
Good	21	46,7
Satisfactory	2	4,4

Tab. 2. Distribution of the patients according to the amount of the deformity and pain and its severity in the spine in late follow-up

Amount of the deformity	Part of the spine			
	Thoracic		Lumbar	
	Prior to operation	1 year follow-up	Prior to operation	1 year follow-up
40-59	15	2- became less	24	6- became less
60-90	22	6- became less	30	8- became less
91-120	12	5- became less	12	6- became less

Tab. 3. Distribution of the patients according to the amount of the deformity and irradiating pain in 1 year follow-up

Amount of the deformity	Total number of patients			
	Prior to operation		In one year	
	In absolute numbers	In % to the total number of the patients	In absolute numbers	In % to the total number of the patients
40-59	5	18,5	-	-
60-90	12	33,3	3	25,0
91-120	10	83,3	3	25,0

complain on irradiating pain, and the number of patients reduced by three times. Also, the patients noted that the pain feeling became less pronounced and temporary (Table 3).

Sensations analysis in the patients with different amount of the deformity indicated that these patients' quantity became less in both groups (Table 4).

The number of the patients with pain sensation appearing in palpation, especially on the convex side of the deformity (patients of the 2nd and 3rd group), and tenderness in the area of trigger zones and in palpation of spinal processes resulted from reduction of soft tissues tension and normalizing of spinal position with regards to the median line (Table 5).

The number of patients who had tenderness while pressing on the muscles decreased for 30%. In the patients with remained symptom the severity of the pain was much less, especially from the convex side. All other indices revealing in palpation improved.

Late clinical result of 40° spinal deformity correction is illustrated by Patient T., 14 years old, who was admitted into Trauma and Orthopaedic Department of Tusi clinic on 23.09.08. Diagnosis: idiopathic scoliosis, 40° deformity (Fig. 1 f). The patient was operated on 24.09.08. The following operation was carried out – spine osteosynthesis using internal transpedicular system. There were no complications in port-operative period. The deformity has been completely corrected. Four days la-

Tab. 4. Distribution of the patients with the sensation disorder according to the amount of the deformity before and in 6 months after treatment

Amount of the deformity	Total number of patients	
	Prior to operation	After treatment
60-90	4	1 - Limited
91-120	7	2 - Less pronounced

Tab. 5. Distribution of the patients according to pain sensations in palpation in late follow-up depending on the amount of the deformity (n=45)

Location of pain feeling in palpation	Deformity amount in degrees					
	Before	After	Before	After	Before	After
	40-59	2,4±0,7	60-90	14,2±3,6	91-120	34,5± 5,3
	Number	B %	Number	B %	Number	B %
Do you feel tenderness or muscular pain while pressing on them?	3	18,8	7	28,0	5	41,7
Are the spinal or transverse processes painful?	5	31,3	9	36,0	4	33,3
Are the sacroiliac joints painful?	2	12,5	4	16,0	5	41,7
Are the ischium trigger points painful? (Valleix points)?	3	18,8	12	48,0	4	33,3

Fig. 1. the X-rays of thoracolumbar spine of the patient T., 14 y.o. Diagnosis: idiopathic scoliosis, 40°. Before (a) and after operation (b)

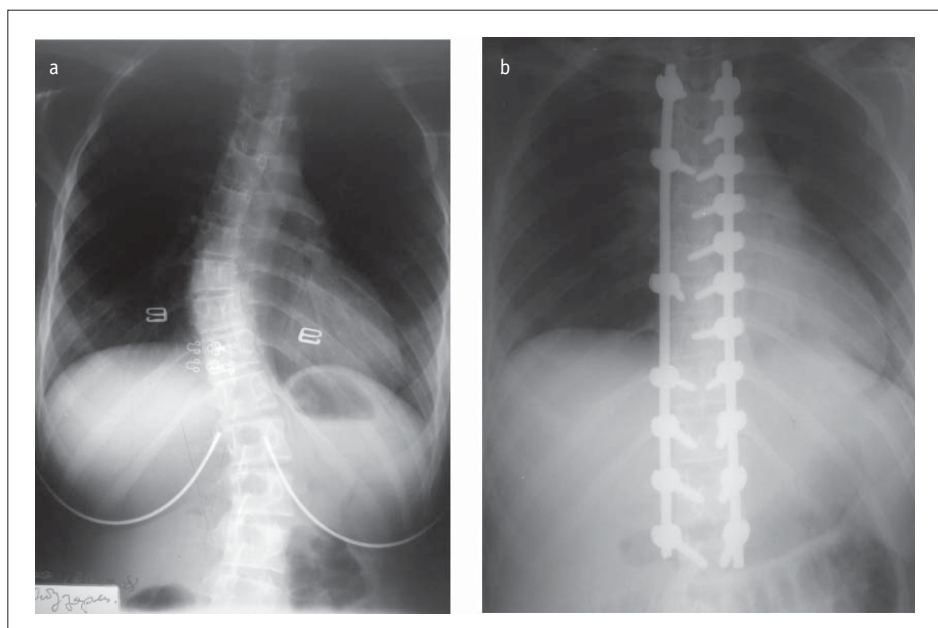


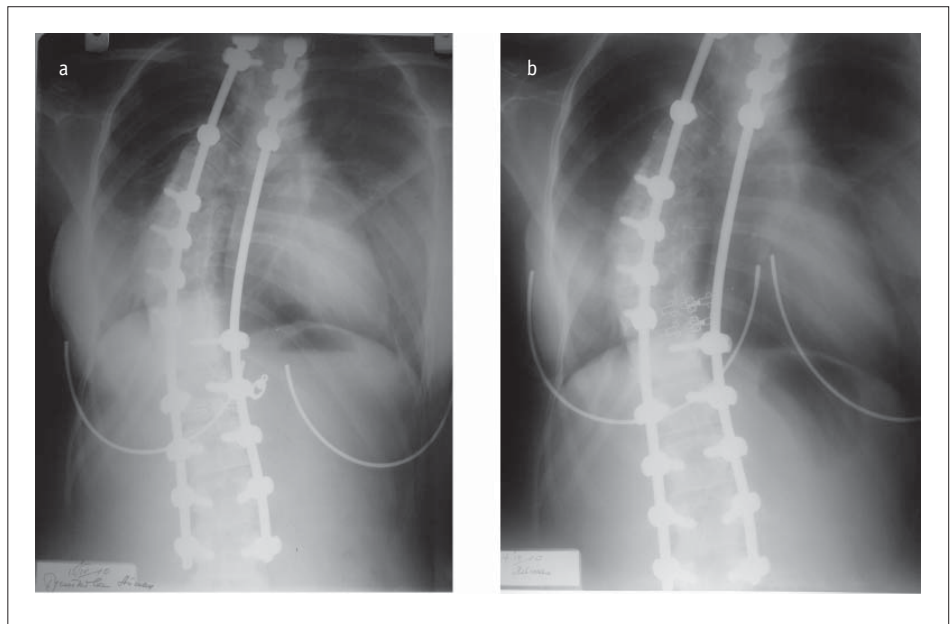
Fig. 2. The X-rays of thoracolumbar spine of the patient T., 14 y.o. Diagnosis: idiopathic scoliosis, 40°. In 1 year and 3 months after operation



Fig. 3. Appearance of the patient A., 17 y.o. (a, b) and X-rays of thoracolumbar spine after traction (c). Diagnosis: idiopathic S-shaped scoliosis, 100° deformity



Fig. 4. The X-rays of thoracolumbar spine of the patient A., 18 y.o. Diagnosis: idiopathic S-shaped scoliosis, 100° deformity. In 6 months (a) and in 1 year after operation (b)



ter (28.09.08.) the patient was discharged for out-patient treatment (Fig.1 b).

Late follow-up was studied in 1 year and 3 months. Obtained correction is preserved, the patient feels good and goes to school (Fig. 2).

The patient A., 17 years old, admitted to Trauma and Orthopaedic Department of Tusi clinic on 27.09.09, can demonstrate a late follow-up in the spine deformity correction exceeding 90°. Diagnosis: idiopathic scoliosis, 100° deformity (Fig. 3).

The patient was operated on 28.09.09. The following operation was carried out – spine osteosynthesis using internal transpedicular system and thoracoplastics. There were no complications in port-operative period. Six days later (03.10.09.) the patient was discharged for out-patient treatment. Late follow-up was studied in 6 months and 1 year (Fig. 4).

The analysis of the complex of indices characterizing the cosmetic and functional result indicated that 47% of the patients had been satisfied with the treatment and 53% of them were very satisfied (Fig. 5).

The treatment results when the patients preserved obtained correction, evident improvement of the appearance (cosmetic result) was observed, the pain in the spine decreased or disappeared and there were no sen-

sations disorder, were considered to be the excellent and good ones in the late follow-up according to clinical and radiological data.

The treatment results were considered to be satisfactory ones when the patients noted moderate pain in the spine in preserved correction and periodic irradiating pain. The patients of the third group were mainly the ones with satisfactory results (Fig. 6).

The expectations on appearance improving have not been completely implemented in the patients with the deformity exceeding 100° when they had residual deformity in the amount of 25-40°. Nevertheless, the patients had no claims against it since they were warned on impossibility of complete deformity correction and also, improving their appearance, they got other positive moments from operative treatment (improvement of internal organs condition, reduction of pain, etc.).

Treatment results of the patient with different severity of idiopathic scoliosis indicated that application of internal transpedicular fixation allows to have differentiated approach to the patient with different severity of idiopathic scoliosis and the modern constructs and equipment give the possibility to eliminate the most severe spinal deformities with good results without neurological complications that is testified by the objective methods of the study and patients questionnaires.

Fig. 5. Cosmetic and functional result of the treatment

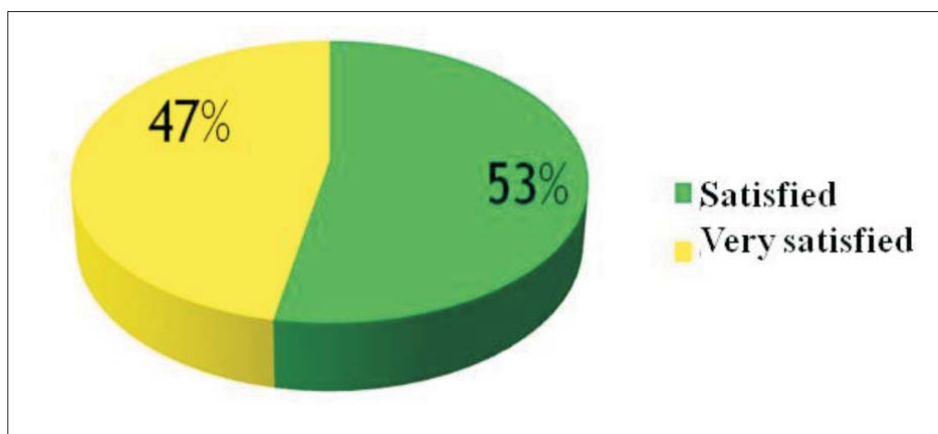
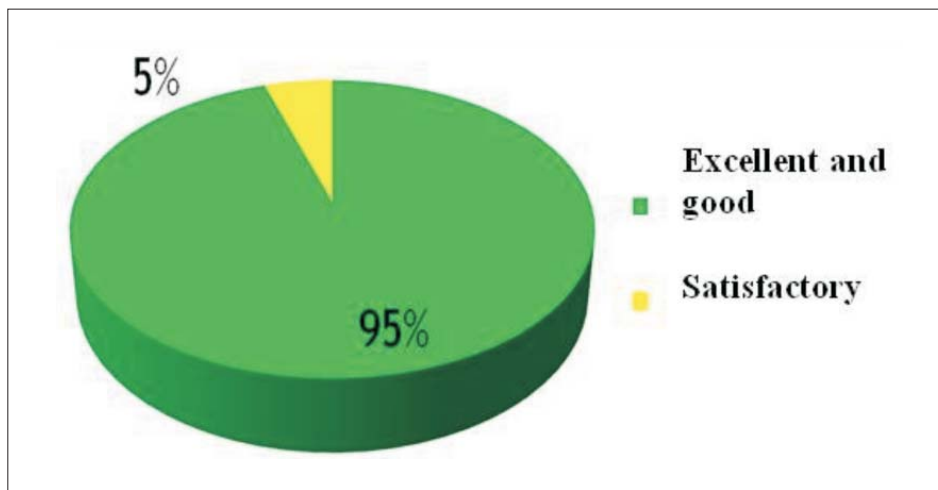


Fig. 6. The results of the patients' treatment



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