Post-operative Health Related Quality of Life Assessment in Scoliosis Patients using the Scoliosis Research Society-22 Patient Questionnaire

Chan CYW, MD
Kwan MK, MS Ortho; Saw LB, MS Ortho; Deepak AS, MS Ortho; Chong CS, MS Ortho; Liew TM; Lee CS **
*Department of Orthopaedic Surgery, University Malaya Medical Center, 50603, Kuala Lumpur, Malaysia; *Medical Students*

ABSTRACT

Adolescent Idiopathic Scoliosis is a spinal deformity which affects patients' self image and confidence. Surgery is offered when the curve is more than 50 degrees based on its likelihood of progression. Studies on the radiological outcome of scoliosis correction are abundant. Therefore, it is the objective of this study to evaluate the health related quality of life in scoliosis patients who had undergone surgical correction in University Malaya Medical Center, Kuala Lumpur, Malaysia using Scoliosis Research Society-22 (SRS-22) patient questionnaire.

This is a prospective evaluation of SRS-22 scores of thirty eight patients operated in our center over the past five years with a minimum follow up of one year. There were thirty two females and six males. Twenty six (68.4%) were Chinese patients, eight (21.1%) Malay patients and four (10.5%) Indian patients. The age of patients ranged from twelve to twenty eight years old, with a mean age of 18.4 ± 3.5. Based on the King and Moe's classification, sixteen patients have King's 3 curve. The mean pre-operative Cobb angle was 68.6° and post operative Cobb angle was 35.8° . The average curve correction was 48.5%.

The overall score for SRS-22 was 4.2. The SRS-22 scores were highest for the pain domains and lowest for the functional domains. Satisfaction domain scored 4.3. The function domain scored significantly higher in those who have twenty four months or less follow up duration. Curve magnitude and the amount of correction did not significantly alter the SRS scores.

In conclusion, patients are satisfied with the outcome of their operation. Although pain is common, the intensity of the pain is minimal. The amount of curve correction does not correlate with the quality of life after operation.

Keywords: Scoliosis surgery, Quality of life, SRS-22

INTRODUCTIONS

Adolescent Idiopathic Scoliosis is a spinal deformity affecting patients at a time when development of self image and confidence enter a crucial stage. Medically, surgical options are offered to patients with curves more than 50 degrees based on natural history studies[1,2]. So, the primary aim of surgical correction is to prevent curve progression[2]. However, cosmesis is also an important motivating factor in making such a decision. Various studies have been done to describe the radiological outcome of scoliosis correction [3,4,5]. This reflects the advances made in terms of instrumentation and technique of correction. Despite giving the surgeon great satisfaction in knowing how much he/she has been able to correct ,, to the patients, the quality of life after operation is probably more important. Therefore, it is the objective of this study to evaluate health related quality of life in scoliosis patients who had undergone surgical correction in University Malaya Medical Center, Kuala Lumpur, Malaysia using the SRS-22 questionnaires.

METHODOLOGY

This is a prospective evaluation of post-operative health related quality of life in patients with the diagnosis of Adolescent Idiopathic Scoliosis operated at a single institution from Jan 2001 to December 2005 who has a follow up of at least one year duration. Patients who underwent revision surgery, those with congenital scoliosis operated during adolescents and those with definite underlying cause for the scoliosis were excluded from the study. Only those with complete clinical, radiological records and were contactable for functional evaluation were included.

Radiological data includes pre-operative standing anteroposterior and lateral views and these radiographs were repeated post-operatively and during each visit to the clinic. The curves were classified based on King and Moe's classification and the magnitude of the curve was defined by the Cobb angle[6]. Besides these patients were evaluated using SRS-22 questionnaire during their final clinic visit.

The SRS-22 questionnaire includes five domains. These are the function/activity, pain, self image/appearance, mental health and satisfaction with management domain. The maximum score for each domain is five.

Statistical analysis was done using student t-test to check for significance between the mean scores in the different domains.

RESULTS

Thirty eight patients were recruited in this study. The mean duration of our follow up is thirty nine months (ranges, 12 to 90 months). There were thirty two females and six males. Twenty six (68.4%) were Chinese patients, eight (21.1%) Malay patients and four (10.5%) Indian patients. The age of patients ranged from twelve to twenty eight years old, with a mean age of 18.4 ± 3.5. When classified using the King and Moe's classification, sixteen patients have King's 3 curve whereas only one patient has King's 4 curve. Seven curves cannot be classified under King's classification as they were isolated thoracolumbar / lumbar curves.

The mean preoperative Cobb angle is 68.6° and post operative Cobb angle is 35.8° (Table 1). The average curve correction is 48.5%. Twenty three patients were corrected using polyaxial pedicle screw system and thirteen patients using hybrid instrumentation. Two patients underwent open anterior instrumentation to improve their flexibility of their curve. .

Table 1. Values for thoracic, lumbar and major Cobb angle, both preoperatively and postoperatively

	n	Mean ± SD	Range
Preoperative thoracic Cobb's angle (°)	31	68.1 ± 23.4	32 - 123
Postoperative thoracic Cobb's angle (°)	31	39.5 ± 18.17	14 - 100
Preoperative lumbar Cobb's angle (°)	23	59.4 ± 17.99	32 – 106
Postoperative lumbar Cobb's angle (°)	23	27 ± 14.43	7 - 63
Preoperative major Cobb's angle (°)	38	68.6 ± 20.17	42 - 123
Postoperative major Cobb's angle (°)	38	35.8 ± 19.19	7 - 100
Percentage of correction in major Cobb's angle (%)	38	48.5	0 - 86

The SRS-22 domain scores are shown in Table 2. The overall score for SRS-22 is 4.2 ± 0.37. Pain domain has the highest scores (4.4 ± 0.51). The function domain scored the lowest (3.8 ± 0.52). Nevertheless, patients are generally satisfied with the treatment with the average domain value of 4.3.

Table 2. Overall SRS-22 scores and scores for each of the five domains

SRS-22 Domain	Mean ± SD	Range
Function/Activity	3.8 ± 0.52	2.8 - 5
Pain	4.4 ± 0.51	3.2 - 5
Self-image/ Appearance	3.9 ± 0.69	2.8 - 5
Mental health	4.3 ± 0.75	3 - 5
Satisfaction with management	4.3 ± 0.79	1.4 - 5
Overall score	4.2 ± 0.37	3.4 - 4.9

Using the SRS-22 questionnaire, we found no significant difference in the overall scores between patients with pre-operative Cobb angle of 75 degrees with those with pre-operative Cobb angle more than 75 degrees. We tested the significance in the difference in scores of patients who obtained more than fifty percent correction and those who had less correction than that and found that the amount of correction also does not correlate with the scores. The function domain scored significantly higher in SRS-22 for those who have twenty four months or less follow up duration..

DISCUSSION

In general, operative management of Adolescent Idiopathic Scoliosis is offered to patients with curves

more than 50 degrees based on natural history studies [1,2]. This is to halt curve progression and to prevent respiratory complications in later life. Even up to now, most would agree with this guideline.

However, instrumentation for scoliosis surgery has progressed much since then. Correction by distraction using the Harrington Rod had quickly evolved to usage of segmental correction using hooks[7]. The introduction of pedicle screws into the fold prompted many surgeons to switch to this newer method of instrumentation[8]. It offers control of all three columns of the spine without encroaching into the spinal canal. Its use started in the lumbar spine. After anatomical and cadaveric studies showed that even the thoracic spine can accommodate pedicle screws, most surgeons nowadays use pedicle screw system as the method of instrumentation in scoliosis correction [9,10,11]. Evidence of its superiority in terms of its correction capability is also abundant in the literatures [8,12,13,14].

Despite this, a patient's perception of success is not only defined by the amount of surgical correction. Functional outcome, symptom relief, improvement in self image and overall satisfaction probably are more pertinent. These are the components included in the SRS-22 questionnaire assessment.

Our results showed that the function domain in the SRS-22 questionnaire scored the lowest with a mean score of 3.8 ± 0.52. This shows that function wise, patients who have been operated for scoliosis feel that they are not able to perform optimally even after one year post correction. This finding is shared by Crawford et al and Newton et al, whose patients also scored the lowest in the post-operative function domain using the SRS-24 questionnaire [15,16]. One surprising finding is that patients with follow-up of two years or less have significantly higher function scores in the SRS-22 questionnaire. This could indicate that the post-operative restriction in function actually plateau off at two years follow up and subsequently the degenerative process will make the patients less active.

Pain among scoliosis patients is quite common. Helenius et al in their review of 78 patients who had undergone Harrington instrumentation noted that up to 13% of patients had back pain[17]. Remes et al compared outcome of Cotrel Dubosset instrumentation and Universal Spine System system and found a higher incidence of back pain in patients who had undergone Cotrel Dubosset instrumentation[18]. The domain that has the highest score in the SRS-22 questionnaire is the pain domain. It shows that most patients in our population who had undergone scoliosis correction had minimal pain not requiring any analgesics.

Satisfaction in general was good among our patients. This finding is similar to most papers [15,16,19,20]. However, no difference was found between the scores of those with curves more than seventy five degrees and those with less severe curves pre-operatively. We also found that the amount of correction did not correlate with satisfaction scores.

Our study has several weaknesses. We were not able to include all patients with more than one year follow up as some of them had changes in contact addresses. We also did not have pre-operative scores for comparison to see whether the operation resulted in any improvements in the score.

CONCLUSION

In conclusion, our patients were generally satisfied with their life as well as the outcome of the operation. However, our results showed that even after one year post-correction, their function score was still lower than other domains. Despite many reports revealed that pain is common, the severity of pain actually did not affect our patients much and they were able to tolerate it without any analgesics. Correction rate did not correlate with satisfaction scores.

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Correspondence:
Dr Chris Chan Yin Wei
Department of Orthopaedic Surgery, University Malaya Medical Center, 50603 Kuala Lumpur, Malaysia.
Telephone No.: +603-79402446/2061
E-mail: chrnat01@yahoo.com