Libyan international medical university
Faculty of Basic Medical Sciences

Scoliosis

Submitted by : Rela Yahia

Supervisor : Dr.Sara

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Abstract:
Scoliosis, simply defined as a lateral curvature of the spine, has been recognized clinically for centuries. The deformity is actually much more complex and to describe more completely and quantify scoliosis deformity, three planar and three dimensional terminology and measurements are required . However, for practical purposes the deformity is most conventionally measured on standing coronal plane radiographs using the Cobb technique

For a few of the patients an underlying cause can be determined, including congenital changes, secondary changes related to neuropathic or myopathic conditions, or later in life from degenerative spondylosis. However, the cause of most scoliosis is not known and since about 1922 such patients have been diagnosed as having idiopathic scoliosis.

Introduction:

Scoliosis with progressive deformity can develop late in life. The authors studied 200 patients older than age 50 years with back pain and recent onset of scoliosis. Seventy-one percent of patients were women, and no patient had undergone spinal surgery. The curves involved the area from T12 to L5 with the apex at L2 or L3 and did not exceed 60 degrees. Degenerative facet joint and disc disease always were present, and the curves were associated with a loss of lumbar lordosis. Forty-five patients with severe pain and neurologic deficits were studied using myelography. Indention of the column of contrast medium was seen at several levels but was most severe at the apex of the curve. It was least severe at the lumbosacral joint. The curves progressed an average of 3 degrees per year over a 5-year period in 73% of patients. Grade 3 apical rotation, a Cobb angle of 30 or more, lateral vertebral translation of 6 mm or more, and the prominence of L5 in relation to the intercrest line were important factors in predicting curve progression

Case1

A 37-year-old female patient with LIS from Norway presented in the office of the first author in January 2014. She had experienced chronic pain (low back pain, LBP) since the age of 23. She refused to consider surgery. Her Cobb angles were 56° thoracic and 50° lumbar, with the curvatures rather balanced and her angles of trunk rotation values (ATR) were 17° thoracic and 3° lumbar as measured with a Scoliometer.

Discussion:

This case reveals that daily exercise and part-time bracing can potentially reduce pain in the adult scoliosis population. The patient revealed that since her initial appointment, her quality of life improved substantially. She was instructed in Schroth exercise while in Germany, which she continued in Norway, and she subsequently transitioned to a home program.After one year of part-time brace treatment, she remains satisfied. Additionally, she succeeded in improving her deformity clinically and on x-ray as well. Patients with LIS do not necessarily experience chronic pain, and natural history studies have shown that they function well, even after 50 years. Therefore, only a small percentage of patients with idiopathic scoliosis may require treatment in adulthood. If, however, pain exists in adults with spinal deformities, conservative treatment is the logical first choice prior to surgical intervention. It should be emphasized that conservative treatments can differ substantially. The treatment course in this case study consisted of pattern-specific exercises and a compatible pattern-specific brace treatment according to Schroth Best Practice updates to the Schroth Method. General exercises and symmetric bracing would not likely have resulted in the same effect . For the Schroth program, there is evidence in studies with large cohorts that pain can be reduced . For best results, corrective exercises should be used including training of pattern-specific self-correction during activities of daily living (ADL). Nevertheless, additional information and studies are necessary in order to establish a body of evidence large enough to influence current guidelines. In conclusion, patients with LIS and pain may benefit from a pattern-specific conservative treatment approach. In this population, surgical intervention should be regarded as a secondary treatment choice because surgery comes with long-term unknowns.

Case2

A 76-year-old man with severe curvatures of 111° thoracic and 118° lumbar presented at the office of the author in January 2015 . His scoliosis was first observed before he was 4 years old. The patient reported having no brace treatment or surgery over the course of his lifetime and rarely needing a physician. He participated in regular sports activities and was treated by a physiotherapist in Germany for his scoliosis. His office visit marked the fourth time in his life he has had radiographs. He stays active by participating in endurance sports like jogging but recognizes his restrictive ventilation disorder (shortness of breath) when he is inactive. The patient never considered scoliosis surgery. His only complaints are shortness of breath and cosmetic concerns.

Discussion:

Winter and Lonstein reported a case of long-term follow-up after early surgery for pediatric spinal deformity. Their case series includes patients with scoliosis of different etiologies. Their non-operative cases show a poor outcome. One patient, with a decompensated single thoracic curve, suffered a collapsing spine and early death due to severe cor pulmonale. Several case reports conclude that early surgery is necessary to achieve the best possible results. However, nearly all of the patients required reoperation and some experienced disabling chronic pain. Alternatively, the patient discussed in this case report demonstrates that not all patients with EOS would choose scoliosis surgery retrospectively, even more than 70 years after the initial diagnosis. Given the contrasting cases presented, stating that scoliosis surgery is lifesaving is definitively impossible . Some patients with curvatures exceeding 100° after growth, such as this man, are living a reasonable life without surgery, although not without distinct challenges. The current state of scoliosis literature largely ignores this patient population for various reasons. A lack of follow-up may occur between patients and their physicians, particularly those who resist surgical intervention. Patients who were recommended for surgery may also seek alternative treatments or no treatment at all. However, to date, parents of children diagnosed with EOS are less likely to refuse scoliosis treatment. The reason for this is that evidence now exists showing that scoliosis may potentially progress without intervention, especially in high-risk cases such as EOS. Furthermore, bracing can successfully halt or slow curve progression for patients and families not willing to consent to surgery. Newly developed 3D braces supported by specific exercises have been shown to be highly corrective and can be used to successfully treat early-onset pediatric spinal deformities. This computer-aided bracing technology, designed according to curve classification, offers the possibility of improving EOS during the pubertal growth spurt, not just stopping curvature progression . At present, no evidence suggests that scoliosis surgery is superior to the natural history of the condition. Moreover, the long-term effects of spinal fusion may lead to a high reoperation rate and other long-term complications . When treating EOS and congenital scoliosis , high-quality conservative treatment should be attempted to avoid spinal surgery. In light of new developments in the field of scoliosis research, only a small subset of patients with early-onset spinal deformities treated with bracing may require scoliosis surgery. Finally, the patient from this case report never consulted a spine surgeon during the course of his adult life. This implies that a subset of EOS patients who have declined surgery exists. As a result, these patients are not included in studies put forth by spine surgeons. In addition, we have to consider that patients suffering from adverse effects of spine surgery are often lost to follow-up . This may cause a reasonable bias in publications on this topic.A case report is of limited evidence. However, a phenomenon exists wherein untreated scoliosis patients with curvatures exceeding 100° may have a reasonable quality of life and would not choose to undergo surgery. More cases of untreated patients and curvatures exceeding 100° need to be found and published to gain more evidence.

In conclusion, the surgery practice for EOS is not supported by a high-quality research. Patients with curvatures exceeding 100° after puberty may have a reasonable quality of life when they lead an active life

with regular participation in endurance sports and physical rehabilitation. In the absence of symptoms, some patients do not want surgery. Severe cases, as reported in literature, now have the potential to be managed with high-quality conservative treatment rather than immediate surgery.

Case3

This is a case of a 5'4'' (165 cm), 127lb (58 kg) 15-year-old female, who presented with musculoskeletal back pain, and associated abnormal spinal curvature. Past medical history was unremarkable. She was greater than 2 years post menarchal status and had no medical problems. Clinical exam and full spine radiographs revealed 18° of dextroconvex thoracolumbar scoliosis with right-sided muscle asymmetry, core deconditioning, right-lower pelvic unleveling, and associated biomechanical motion restrictions of the thoracolumbar spine. Current radiographs were compared with prior radiographs from two years earlier, and both films demonstrated an augmentation of the scoliotic curve by 7° degrees. Additionally, the patient's current Risser's score was evaluated as stage two. Neurological and cardiovascular assessments were intact. Complete blood count, erythrocyte sedimentation rate, and a C-reactive protein measurement were found to be within normal limits. There were no systemic symptoms, nor major deficits upon clinical exam or diagnostic studies. Therefore, without the presence of the previous factors, there was no need for immediate concern, and the clinical diagnosis of Adolescent Idiopathic Scoliosis (AIS) was recognized.

Discussion:

Current research shows minimal guidance regarding the treatment approach for AIS. Observation and non-surgical approaches are always considered first line, but there is not enough emphasis on such models . Spinal manipulation providers claim that this procedure can correct scoliosis . Literature remains controversial, but is clear that appropriate differential diagnosis and early detection is the key for effective treatment, and improvements in quality of life . Furthermore, there is not enough emphasis in similar cases, regarding the importance of the psychological issue involved with visual postural deformity with young females, and such topic should always be addressed, and considered as a valid treatment goal, with appropriate co-management if necessary . Several similar studies reinforce the importance of spinal manipulation alone , or in addition to craniosacral therapy , exercises and adjunctive therapies , as an appropriate method for non-pharmacological pain management of musculoskeletal pain resulted from scoliosis. There are also significant results in similar cases with reduction of curvatures, and maintenance on body conditioning with overall no progression of symptoms, or scoliotic curves with utilization of spinal manipulative treatment (SMT) . In addition, there is growing evidence supporting the utilization of physical activity, i.e., Yoga or Pilates, for conservation of appropriate muscle balance in patients with scoliosis, core deconditioning, and musculoskeletal back pain . Evidence-based clinical guidelines recommend the utilization of spinal manipulation in the treatment of musculoskeletal pain with intended goal or effect on positive symptomatic relief, and objective measurable gains in functional improvement (i.e., improvements in outcome assessment scores for pain, function, or behavioural components, reduction of curvature, or limiting progression in case of scoliosis, facilitate progression in the patient's therapeutic exercise program, and return to productive activities) . Although this is the report of only one case, this option should be consider, as it is much less aggressive, and without the risk of disability caused by surgery. Spinal manipulation and adjunctive therapies can be useful for treating scoliosis with associated cosmetic concerns, and musculoskeletal pain.

Conclusion:

Scoliosis, or abnormal curvature of the spine, is a prevalent disease and also is the most commonly diagnosed spinal abnormality. Over the years, school screening programs have bolstered the diagnosis of the disease. There are four types of scoliosis (congenital, neuromuscular, degenerative, and idiopathic) and each has its own origins or explanations. Treatment options for scoliosis include surveillance, back bracing, and spinal surgery. Many factors have to be taken into consideration when treating scoliosis.

References:

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