

Scheuermann's Kyphosis

Patrick Graham

Introduction

With varying theories as to its true pathogenesis, Scheuermann's kyphosis (SK) is the most prevalent form of hyperkyphotic deformity of the thoracic and thoracolumbar spine. The hallmark report is that of "poor posture," with or without associated thoracic back pain, and typical presentation during adolescence or early adulthood. The defining and characteristic radiographic finding of SK is that of three or more contiguous vertebrae with at least 5° of anterior wedging. When cases are mild and identified early, there is significant potential for functional gains and correction with the appropriate application of bracing and tailored physical therapy interventions. For those who fail conservative management, with evidence of progressive deformity, continued pain, issues with cosmesis, rarely neural, pulmonary, or cardiovascular compromise, surgical correction is the necessary intervention (Bezalel et al., 2019; Etemadifar et al., 2017; Huq et al., 2019; Lowe, 2007; Sardar et al., 2019; Soo et al., 2002; Wood et al., 2012).

Case Presentation

A 48-year-old man presented to the outpatient clinic for evaluation of chronic back pain. He reported an overall vague history with a minor motor vehicle accident, without any specific associated evaluation or intervention, several years prior. He primarily noted stiffness and aching mid-thoracic lower back pain associated with prolonged sitting. With his profession being primarily computer-based work, he was having recurrent daily symptoms. During prior times of more severe pain, he had seen a chiropractor and trialed massage, both of which did provide relief. He had not trialed any formal physical therapy but did stretches to combat stiffness during the day. He did not routinely take medications, noting he had to be in severe pain to take something like Advil (ibuprofen). There were no associated arm or leg symptoms, weakness, incoordination, or clumsiness.

On evaluation was a slender male, alert, oriented, affect-appropriate, and in no apparent distress. He ambulated with a steady gait, without use of an assistive device. He postured with protracted shoulders and mildly increased kyphosis that was minimally improved with postural cues. His back was without abrasions or discoloration. He displayed symmetrical cervical range of motion that was smooth and painless. He noted mild

mid-back discomfort with end-range lumbar flexion, painless extension, and rotation that was painless and symmetrical. Strength testing was 5/5 throughout all extremities. Reflexes were found to be equal and normal. He reported intact sensation to light touch in all dermatomes with palpable distal pulses and brisk capillary refill. Lhermitte's, Spurling, Slump, and Gaenslen's tests were all negative, and he displayed a coordinated heel-shin slide as well as tandem gait.

Management

Imaging reviewed at the time of consultation included anteroposterior, lateral, flexion, and extension radiographs of the thoracic spine (see Figure 1). There was no evident acute osseous abnormality but was revealing for contiguous wedging of multiple thoracic vertebrae, consistent with SK. As his symptoms were overall mild and tolerable, with a lack of neurological symptoms or other abnormal clinical findings, the patient elected to forego any advanced imaging. Given the modest curve and the patient's age and functional level, with employment of a sedentary nature, it was recommended he trial a formal course of physical therapy. An initial home exercise program, including postural cues for work at computer, was provided. Instructions were also given for the appropriate use of over-the-counter medications, primarily nonsteroidal anti-inflammatory drugs, with addition of acetaminophen and topical as needed, for day-to-day symptom management (Bezalel et al., 2019; Etemadifar et al., 2017; Huq et al., 2019; Lowe, 2007; Sardar et al., 2019; Soo et al., 2002; Wood et al., 2012).

At 7-week follow-up, having completed nine sessions of physical therapy, the patient noted an overall improvement of his back symptoms. He also attributed this improvement to switching to a new desk chair that helped with his posture. He did not have a need for daily medications and was pleased with the improvement. He was instructed to have annual follow-up for surveillance.

Patrick Graham, MSN, RN, APRN/ANP-BC, Banner University Medical Center Tucson, Tucson, AZ.

The author has disclosed no conflicts of interest.

Correspondence: Patrick Graham, MSN, RN, APRN/ANP-BC, Banner University Medical Center Tucson, 265 West Ina Rd, Tucson, AZ 85704 (graham.pw@gmail.com).

DOI: 10.1097/NOR.0000000000000914

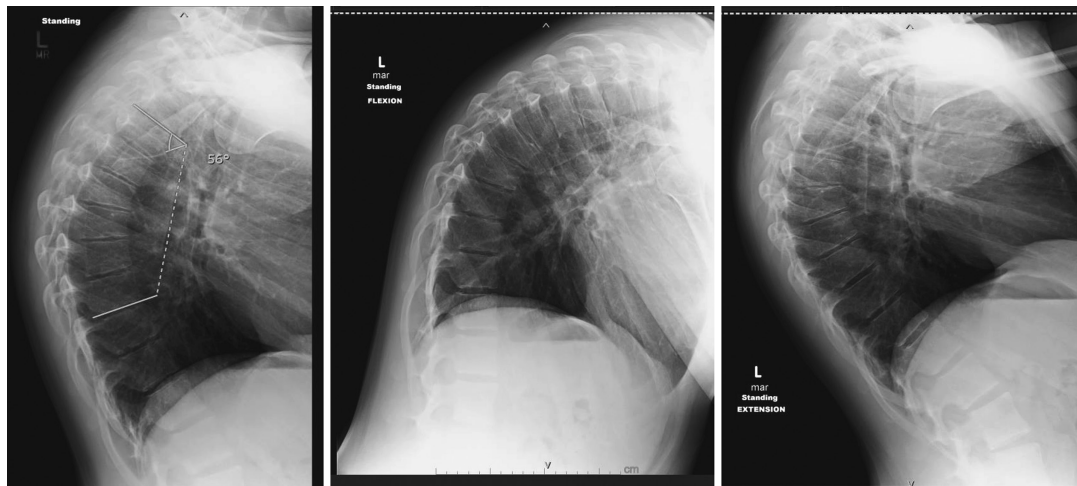


FIGURE 1. Lateral, flexion, and extension radiographs—Note the contiguous anterior wedging of thoracic vertebrae with a measured angle of 56° and no dynamic instability.

Discussion

With an estimated prevalence of up to 10%, SK should be included in the differential diagnosis for those patients presenting with thoracic back pain and the classic “poor posture” of increased kyphosis, especially if in the adolescent population. Radiographic evaluation is usually sufficient for initial evaluation and monitoring. It is important to monitor for progression, both radiographically and symptomatically, when evaluating for the need for further intervention. For those with milder kyphotic angle and symptoms, typically defined as curvature of less than 70°, conservative management with therapy and bracing should be sufficient for management and, in some cases, provide some correction of deformity. For those with progressive symptoms, especially in the face of any neurological, pulmonary, or cardiovascular compromise, it is most appropriate to seek consult with an orthopaedic spine surgeon (Bezalel et al., 2019; Etemadifar et al., 2017; Huq et al., 2019; Lowe, 2007; Sardar et al., 2019; Soo et al., 2002; Wood et al., 2012).

The trusted historical approach, and prior body of literature, would confirm the recommendation for a combination anterior and posterior approach for achieving optimal results. With the evolution of surgical techniques, orthopaedic spine specialists are now achieving similar amounts of correction, with fewer complications and shorter hospital stay, using the posterior approach alone. This has caused a gradual shift in the debate around the most appropriate surgical recommendation. Specific patient factors including age, comorbid conditions such as diabetes, involved levels with degree of anticipated correction, as well as associated risk of complication, are primary in surgical decision-making (Bezalel et al., 2019; Etemadifar et al., 2017; Horn et al., 2019; Huq et al., 2019; Lee et al., 2020; Lowe, 2007; Sardar et al., 2019; Soo et al., 2002; Wood et al., 2012).

REFERENCES

- Bezalel, T., Carmeli, E., Levi, D., & Kalichman, L. (2019). The effect of Schroth therapy on thoracic kyphotic curve and quality of life in Scheuermann's patients: A randomized controlled trial. *Asian Spine Journal*, 13(3), 490–499. <https://doi.org/10.31616/asj.2018.0097>
- Etemadifar, M. R., Jamalaldini, M. H., & Layeghi, R. (2017). Successful brace treatment of Scheuermann's kyphosis with different angles. *Journal of Craniovertebral Junction & Spine*, 8(2), 136–143. https://doi.org/10.4103/jcvjs.JCVJS_38_16
- Horn, S. R., Poorman, G. W., Tishelman, J. C., Bortz, C. A., Segreto, F. A., Moon, J. Y., Zhou, P. L., Vaynrub, M., Vasquez-Montes, D., Beaubrun, B. M., Diebo, B. G., Vira, S., Raad, M., Sciubba, D. M., Lafage, V., Schwab, F. J., Errico, T. J., & Passias, P. G. (2019). Trends in treatment of Scheuermann kyphosis: A study of 1,070 cases from 2003 to 2012. *Spine Deformity*, 7(1), 100–106. <https://doi.org/10.1016/j.jspd.2018.06.004>
- Huq, S., Ehresman, J., Cottrell, E., Ahmed, A. K., Pennington, Z., Westbroek, E. M., & Sciubba, D. M. (2019). Treatment approaches for Scheuermann kyphosis: A systematic review of historic and current management. *Journal of Neurosurgery: Spine*, 32(2), 235–247. <https://doi.org/10.3171/2019.8.SPINE19500>
- Lee, C. H., Won, Y. I., San Ko, Y., Yang, S. H., Kim, C. H., Park, S. B., & Chung, C. K. (2020). Posterior-only versus combined anterior-posterior fusion in Scheuermann disease: A systematic review and meta-analysis. *Journal of Neurosurgery: Spine*, 34(4), 608–616. <https://doi.org/10.3171/2020.7.SPINE201062>
- Lowe, T. G. (2007). Scheuermann's kyphosis. *Neurosurgery Clinics of North America*, 18(2), 305–315. <https://doi.org/10.1016/j.nec.2007.02.011>
- Sardar, Z. M., Ames, R. J., & Lenke, L. (2019). Scheuermann's kyphosis: Diagnosis, management, and selecting fusion levels. *Journal of the American Academy of Orthopaedic Surgeons*, 27(10), e462–e472. <https://doi.org/10.5435/JAAOS-D-17-00748>
- Soo, C. L., Noble, P. C., & Esses, S. I. (2002). Scheuermann kyphosis: Long-term follow-up. *The Spine Journal*, 2(1), 49–56. [https://doi.org/10.1016/s1529-9430\(01\)00168-1](https://doi.org/10.1016/s1529-9430(01)00168-1)

Wood, K. B., Melikian, R., & Villamil, F. (2012). Adult Scheuermann kyphosis: Evaluation, management, and new developments. *Journal of the American*

Academy of Orthopaedic Surgeons, 20(2), 113–121.
<https://doi.org/10.5435/JAAOS-20-02-113>

For additional continuing professional development activities on orthopaedic nursing topics, go to nursingcenter.com/ce.