Positive sagittal malalignment

Deformity, particularly positive sagittal malalignment, may go undetected unless one maintains a high index of suspicion and obtains long radiographic cassette. It is recommended that spine surgeons recognize the prevalence and importance of such deformity when contemplating operative intervention [1].

Vendatam et al. [2] demonstrated that the mean sagittal vertical axis (SVA) shifts forward in the ageing population from −5.6 cm in adolescents to −3.2 cm in the middle aged and elderly population. A strong correlation exists between a positive shift in the SVA and a loss of lumbar lordosis and the onset of symptoms in patients, such as back pain and fatigue. Moreover, Glassman et al. [3] [4] demonstrated that a positive sagittal imbalance was the most reliable radiographic predictor and indicator of clinical health status. It was shown in 352 patients that a mildly positive sagittal imbalance is detrimental with a linear fashion increase in symptoms with progressive sagittal imbalance. It is of note that disability was worse amongst those with a degree of kyphosis in their lumbar spine in comparison to the normal and lordotic lumbar spines. The causes of sagittal spine imbalance are multifactorial and these range from iatrogenic causes to genetic and metabolic causes.

1)
Maggio D, Ailon TT, Smith JS, Shaffrey CI, Lafage V, Schwab F, Haid RW Jr, Protopsaltis T, Klineberg E, Scheer JK, Bess S, Arnold PM, Chapman J, Fehlings MG, Ames C; AOSpine North America; International Spine Study Group. Assessment of impact of standing long-cassette radiographs on surgical planning for lumbar pathology: an international survey of spine surgeons. J Neurosurg Spine. 2015 Jul 31:1-8. [Epub ahead of print] PubMed PMID: 26230421.
2)
Vendatam R, Lenke LG, Keeney JA, Bridwell KH. Comparison of standing sagittal spinal alignment in asymptomatic adolescents and adults. Spine. 1998;23(2):211–215. doi: 10.1097/00007632-199801150-00012.
3)
Djurasovic M, Glassman SD. Correlation of radiographic and clinical findings in spinal deformities. Neurosurg Clin N Am. 2007;18(2):223–227. doi: 10.1016/j.nec.2007.01.006.
4)
Glassman SD, Bridwell K, Dimar JR, Horton W, et al. The impact of positive sagittal balance on adult spinal deformity. Spine. 2005;30(18):2024–2029. doi: 10.1097/01.brs.0000179086.30449.96.