

Moiré Fringe Topography in Scoliosis Detection and Management

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Scoliosis, kyphosis and lordosis are body-disfiguring conditions detectable around the age of 8 years. They deteriorate quality of life for children and adults. Females are affected 5 times more than the males. These deformities may distort the torso; severely damage heart, lung and kidneys and may require major spinal surgery involving delicate nerves. If recognized at an earlier stage, these deformities may be treated by a combination of exercises and braces. A two-minute-orthopedic examination, with the child completely undressed except short underpants, may be able to alert the pediatrician to early-warning signs. Our group tested a protocol in a local school, applied to 7- and 8-year-old students of both genders, to select the students for possible moiré examination. As scoliosis is a combination of lateral curvatures and rotations of the spinal column, moiré fringe topography proved to be the best way to detect and document rotations, whereas AP-X ray of the spinal column from external auditory meatus to hip joint highlighted lateral curvatures. Hence, these two techniques were used as complimentary techniques to design an efficient and an effective course of intervention. Moiré fringe topography is non-contact, non-distorting, non-invasive, stereophotogrammetric technique, which provides a three-dimensional height map of human back, in the process giving a visual or a graphic profile of left-right asymmetries. AP (standing), lateral (standing with hand held together in two postures — the first one stretched in front, parallel to floor and the second one held above the head, perpendicular to floor and the child asked to lift heels in the mild-stretching position), lateral (touching toes without flexing knees) moiré topographs were obtained in the SF-Growth-and-Imaging Laboratory to document and quantify spinal curvatures based on the model of spinal column developed earlier <http://www.ngds-ku.org/Papers/J18.pdf>.

Keywords: Moiré fringe topography, scoliosis, lordosis, kyphosis, spinal rotation

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Research Ethics: Project initiated after Institutional Review Process and conducted in compliance with ethical and human-right standards in our region.

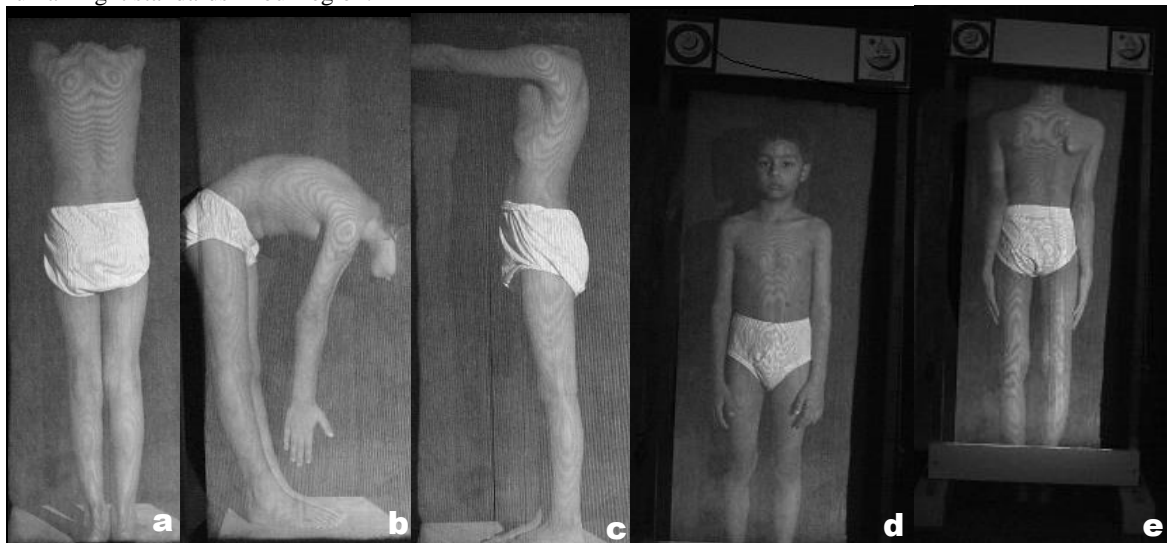


Fig. 1a-e. Moiré topographs of (a) mild-stretching — back, (b) forward bending — side, (c) standing with hands held in front — side (d) attention position — front and (e) attention position — back to document scoliosis

Web address of this document: <http://www.ngds-ku.org/Presentations/Moire.pdf>

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