

基於三維超聲的脊柱側彎的評估 3D Ultrasound Imaging for Spine Scoliosis

無輻射脊柱彎度測量

A radiation-free system for scoliosis evaluation

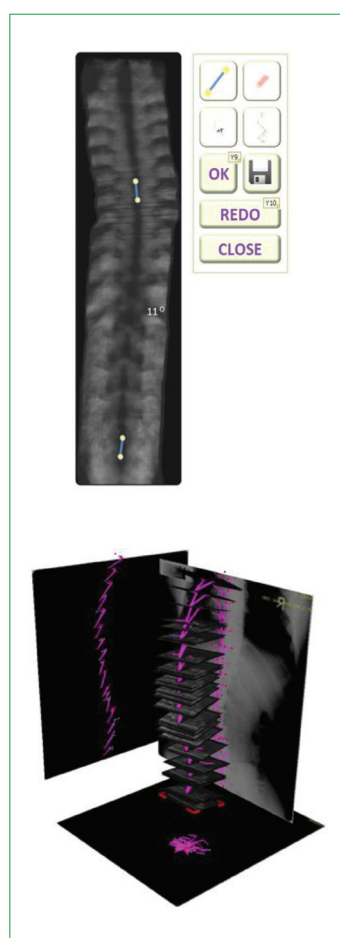
先天性少年脊柱側彎是小孩中最常見的一種脊柱變形，其發生率為2 - 4%。用X光成像來測量脊柱的彎度是目前最常用的評估方法。但是由於X光的輻射有害，且不可頻繁使用，尤其是對年輕的女性，所以在脊柱側彎的治療過程中很難有連續的效果評估。因此，基於三維超聲成像技術，我們開發了一套沒有輻射的脊柱側彎評估系統。



基於三維超聲的脊柱側彎的評估
3D ultrasound imaging for spine scoliosis



用具有空間定位的超聲探頭來採集患者脊柱的三維超聲圖像
Collection of 3D ultrasound images from the subject using an ultrasound probe with spatial sensor



用於三維超聲脊柱側彎評估的軟件界面，每張超聲圖像包含了脊柱骨的特徵點
Software interface for 3D ultrasound evaluation of scoliosis, with images showing bony landmarks

Adolescent Idiopathic Scoliosis (AIS) is the most common spinal deformity among children and the prevalence of scoliosis is 2-4 % of the general population. Using X-ray images to measure the spine curvature is the most widely used method for quantifying the severity of scoliosis. Unfortunately, X-ray has the radiation hazard and cannot be used frequently for the subjects, particularly for female kids. And this also makes it difficult to monitor the curing effect during the AIS treatment. Therefore, we have developed a novel, radiation-free system for scoliosis evaluation based on 3D ultrasound imaging techniques.

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專利申請編號及國家：ZL 200510127193.8 (中國), 12/509,705 (美國)

特色與優點

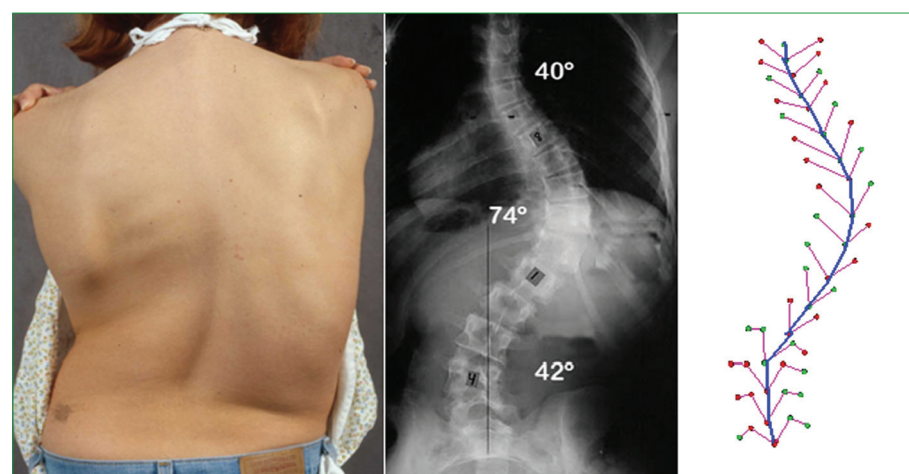
- 無輻射
- 準確度高
- 快速省時
- 多方向的角度測量
- 方便移動

應用

這一原創性的評估系統可作多次的脊柱側彎測量而不受任何輻射的影響。由於其方便移動和安裝，因此在不同的場合都可為脊柱側彎作審查及評估。同時，本系統可對脊柱側彎治療過程中的效果作連續性的評估。

獎項

- 第40屆瑞士日內瓦國際發明展 - 金獎(2012年4月)
- 第40屆瑞士日內瓦國際發明展 - 伊朗大學特別大獎(2012年4月)
- 第62屆iENA德國紐倫堡國際發明展 - 銀獎(2010年10月)



(A) 一位有脊柱側彎的女性患者 (B) 其脊柱的X光成像 (C) 三維超聲脊柱側彎評估
A) A female subject with scoliosis (B) the X-ray image of her spine curvature (C) 3D ultrasound evaluation

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Special Features and Advantages

- Radiation-free
- Accurate
- Time-saving
- Lateral and rotation angles
- Mobile

Application

This novel system can be used for evaluation of any scoliosis and the measurement can be taken as frequently as required without any radiation hazard. Due to its mobile feature, it can be installed anywhere for screening and assessment purposes. Besides, the curing effect can be continuously monitored by this system during the treatment period.

Awards

- Gold Medal - 40th International Exhibition of Inventions of Geneva, Switzerland (April 2012)
- Mau Award for the best Educational Innovation from Mehr Alborz University in I.R.IRAN - 40th International Exhibition of Inventions of Geneva, Switzerland (April 2012)
- Silver Medal - The 62nd International Trade Fair >>Ideas-Inventions-New Products<<, Nuremberg, Germany (Oct 2010)



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