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ORIGINAL ARTICLE

Prognostic value of an immediate lateral standing X-ray with a TLSO in patients with a thoracolumbar burst fracture☆

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Abstract The final collapse of a ''stable'' thoracolumbar burst fracture is difficult to predict.

This collapse was prospectively studied radiologically in patients with T12 or L1 burst fractures who, after evaluating the admission X-rays and the CT scan with the patients themselves, opted for a rigid thoracolumbar brace with support in the sternal manubrium (TLSO). On the other hand, patients with rigid braces sometimes have low back pain on follow-up (due to overload of the L5-S1 joints).

Hypothesis: the standing lateral X-ray with only a TLSO for support (intrinsic mechanical stability) provides information on the final collapse and could also provide information on the low back pain.

The study included 50 patients (20 males and 30 females, age: 63 + 14 years) admitted during 2011 and 2012, with 2 losses to follow-up. Variables: Farcy index and local kyphosis (Cobb at 3 vertebrae). X-rays: admission, with TLSO (immediate: Rx0), and at 3 and 6 months. They were compared with the final clinical and radiological results.

It was decided to surgically intervene in 4 patients after Rx0.

There were no painful sequelae at the fracture level, and 16/44 (31%) had low back pain.

Using linear regression mathematical models, the increase in the Farcy index (Rx0-Rx admission) was associated with the appearance of low back pain and with local kyphosis (Rx0-Rx admission), and with the final kyphosis.

It is advisable to perform a lateral standing X-ray after TLSO for information on the final collapse of the fracture and the appearance of accompanying low back pain.

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PALABRAS CLAVE
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Valor pronóstico de la radiografía lateral inmediata en bipedestación con TLSO en pacientes con fractura estallido toracolumbar

Resumen No se sabe a priori el colapso final de una fractura estallido toracolumbar «estable».

Se estudia prospectivamente dicho colapso radiológico en pacientes con fracturas estallido T12 o L1 que, tras valorar las radiografías y TAC al ingreso junto con el paciente en sí, se optó por una ortesis rígida toracolumbosacra con apoyo en manubrio esternal (TLSO). Por otra parte, los pacientes portadores de corsés rígidos presentan a veces dolor lumbar bajo en el seguimiento (por sobrecarga de las articulares L5S1).

Hipótesis: la radiografía en bipedestación con TLSO nada más ponerla (estabilidad mecánica intrínseca) da información sobre el colapso final y pudiera darla sobre el dolor lumbar bajo.

Cincuenta pacientes (20 hombres y 30 mujeres, edad:63 + 14 años) ingresados durante 2011 y 2012, con 2 pérdidas de seguimiento. Variables: índice de Farcy y la cifosis local (Cobb a 3 vértebras). Radiografías: ingreso, con TLSO (inmediato: Rx0), a los 3 y 6 meses. Se compararon con el resultado final clínico y radiológico.

Tras la Rx0 se decidió intervenir quirúrgicamente a 4 pacientes.

No hubo secuelas dolorosas a nivel de la fractura; 16/44 (31%) presentaron dolor lumbar bajo.

El incremento del índice de Farcy (Rx0-Rx ingreso) se correlacionó con la aparición de dolor lumbar bajo y el de la cifosis local (Rx0-Rx ingreso) con la cifosis final, con modelos matemáticos de regresión lineal.

Se aconseja la realización de una radiografía lateral en bipedestación tras TLSO por la información acerca del colapso final de la fractura y de la aparición de dolor lumbar bajo que aporta.

Introduction

Thoracolumbar fractures are the most common spinal column fractures and the most increasing in number. Of these, the most frequent are fractures at the thoracolumbar junction (T12 and L1), due to the stress-concentration effect produced by progression from kyphosis to lordosis and the loss of thoracic rib cage protection. In the long term, the most limiting sequela is the appearance of a post-traumatic kyphosis, which is difficult to correct and has a natural history of pain with possible spinal injury. In this case the spine fails to maintain its two physiological functions: a painless upright posture and protection of the spinal column.

White and Panjabi defined instability as the loss of the spinal column's ability to carry out the said physiological functions and described instability as neurological (where there is radiculomedullary injury), mechanical instability (cannot remain standing up without pain) and mixed instability (both conditions simultaneously).

Thoracolumbar fractures have been classified in many ways. Over the years, it has been observed that the major classifications have been offering new viewpoints over the pre-existing ones, based on an attempt to view natural history as a guide to treatment. Thus, in addressing their ''stability'' Nicoll, 1949,[1] refers to stable and unstable fractures. Later studies talk about the anatomical injured areas of the spine, and of the two columns (Holdsworth, 1963: anterior – bodies, spinal disks and their ligaments – and posterior – facets, laminae, lumbar vertebrae and its ligaments)[2] or three columns (Denis, 1984: concept of mid spine, posterior vertebral wall and combination of common vertebral posterior ligament and posterior fibrous ring).[3] Subsequently, the underlying idea of classification was not just where the injury was but also what the state of the spine was after the injury: its morphological characteristics; the AO classification (Magerl, 1984),[4] based on 3 categories: vertebral body compression, anterior and posterior element injuries with distraction and anterior and posterior element injuries with rotation resulting from axial torque. Another guideline is the distribution of load transmission (McCormack, 1994),[5] which is based on the communition of the body in the CT scan, the apposition of bone fragments and the amount of post-operative correction performed (surgical or otherwise). Lately, TLICS classifications (Lee and Vaccaro, 2005)[6] which are conceptually similar to that of Magerl have been made, with specific references to the posterior ligament complex and to neurological status, and very recently the AOSpine group (Reinhold, 2013; Vaccaro and AOSpine group of spine trauma and injury, 2013), classification was published where a morphological classification was added: (a) a finer neurological staging than that of the TLICS was made (including transient and radicular injury) and (b) modifiers due to the patient's state of health (e.g., ankylosing spondylitis or cutaneous burn) influencing decision-making regarding whether to perform surgery or to modify plans for surgery. Morphological classification staging of injury ranges from the most to the least severe (contrary to the previous ones). Firstly it must therefore be determined whether there is dislocation of the medullary canal or not, either due to angulation, translation, rotation, torsion or a combination of these mechanisms: if there is, then this is a type C, if not, we then verify if there is an anterior or