بسم الله الرحمن الرحيم

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Management of Fractures of the Dorsolumbar Spine

By

Ligamentotaxis

Essay

Submitted for partial fullfilment of ***M.Sc.*** degree in Orthopaedic surgery

By

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2002

جامعة القاهرة / كلية الطب
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أجتماع لجنة الحكم على الرسالة المقدمة من
الطبيب / [illegible]
توطئة للحصول على درجة الماجستير / ~~الدكتوراة~~
في [illegible]

تحت عنوان : باللغة الانجليزية : Management of thoracolumbar
by transforaxis

: باللغة العربية : [illegible]

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٣) [illegible] ممتحن داخلي
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قرار اللجنة : [illegible]

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(عصام) [illegible]

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الممتحن الخارجي
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Abstract

"Management of thoracolumbar fractures by Ligamentotaxis"

Thoracolumbar fractures are common fractures occurring at the fulcrum of motion between the relatively fixed thoracic spine and the mobile lumbar spine with bony retropulsion into the spinal canal resulting in neurologic insult. Ligamentotaxis relieves the cord and improves neurologic outcome by reducing the retropulsed segments into place, through using traction by the fixation devices; and countertraction provided by the intact soft tissue sleeve across the fracture site to realign these fragments and clear the spinal canal.

Key words:

Ligamentotaxis - thoracolumbar fractures-burst fractures-canal compromise

ACKNOWLEDGMENT

I would like to express my deepest gratitude and appreciation to my **Professor Dr. Akram Azzam**, Professor of Orthopedic Surgery, Kasr El-Aini, Faculty of Medicine, Cairo University.

It was through his supervision, his meticulous revision and enthusiastic cooperation, and kind encouragement that work come to existence.

I am also very much grateful to Dr. **Wael Tawfic Kaptan**, lecturer of orthopaedic surgery, Kasr El-Aini, Faculty of Medicine, Cairo University. For his meticulous revision and enthusiastic cooperation, and enormous help, unlimited guidance, patience and efforts.

Last , not least , I would like to express my thanks to those who contributed directly or indirectly to this work.

Mohammed Tag Eldeen Elemary

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Introduction

The incidence of fractures of the thoracolumbar spine fractures has increased tremendously over the last few decades, both in the young and the elderly with motor traffic accidents commonly responsible in the young, and increased life expectancy, with people living long enough to suffer from advanced osteoporosis to develop fractures of the their spine only after minor trauma, commonly, falls from a height.

It became essential to develop a suitable treatment protocol for these patients, which after the dedicated work of hundreds of Orthopaedic Surgeons has become clear and applicable.

To treat a patient with thoracolumbar fracture, the surgeon must be able to characterize the fracture pattern guided by the classification schemes suggested and established by the pioneers of spine surgery, then to choose the best way to treat it either with conservative or operative modality of treatment.

Denis in 1983 was the one who introduced the idea of the three-columns and thoroughly explained the concept of spine stability guided by the first trials of **Holdsworth in 1963**.

Spinal stability is not only needed to be maintained to fulfil the weight bearing function of the spine but also to protect the neural structures harbored by the spine.

So the concept of spinal stability was extensively investigated by **Panjapi in 1988** to be formulated in light of the functions of the spine as "the ability of the spine under physiologic loads to maintain relationships between vertebrae in such a way that there is neither damage nor subsequent irritation to the spinal cord or its nerve roots, and in addition there is no development of incapacitating pain or deformity".

The burst type of thoracolumbar fractures greatly puts the spine at risk of becoming unstable because it involves failure of at least two columns, with middle column failing in compression with retropulsion of its bony elements into the canal compromising the neural structures and being the cause for immediate or potential neurologic injury.

Treatment of such fractures must cover these parameters, which are mechanical stability along with relieving the canal from the compromise by the retropulsed segments, either with direct or indirect decompression through ligamentotaxis.

- **The aim of this essay is to discuss the following items :**

- Anatomy of the thoracolumbar spine.
- Biomechanics of the thoracolumbar spine, its fractures and the different modalities of instrumentation.
- Patient evaluation :
  - Clinical evaluation
  - Imaging modalities
- Mechanism of injury
- Classification of thoracolumbar fractures
- Types of instrumentations
  - Non-segmental
  - Hybrid
  - Segmental
- Ligamentotaxis and its technique