RESTORATION OF ENDPLATE INTEGRITY IN A TYPE THORACIC AND LUMBAR VERTEBRAL FRACTURES

Thesis
For partial Fulfillment of MD degree in
Orthopedic Surgery

Submitted by

Mohamed Mosaad Marouf Naseef

Assistant lecturer of orthopedics- Cairo university

Supervised by

Dr. Ahmed Ahmed Morrah

Professor of Orthopedic Surgery

Cairo faculty of medicine

Dr. Hossam Salah

Professor of Orthopedic Surgery
Cairo faculty of medicine

Dr. Ihab Mohamed Emran

Assistant Professor of Orthopedic Surgery
Cairo faculty of medicine

2015

ABSTRACT

.

This studyThree methods were used including balloon in ten cases, instrumented assisted endplate reduction in nine cases, stent in one case, restoration was assessed intra-operative by discography under image intensifier and post-operative using x-rays (cobb's angle, vertebral wedge body angle) and CT scan(anterior and mid-vertebral vertebral body height, endplate configuration, lowest point in any sagittal plan cement appearance and leakage. x-rays and CT scan were used to assess patients radiological before and after the operation.restoration of end plate integrity in type A thoracic and lumbar spine fractures is an effective method to prevent disc creeping in the broken endplate so preventing recollapse after correction of body height and cobb's angle ,however longer term follow up is needed to reassess the morphological changes in the disc following this method comparing it to traditional posterior fixation only, and further study of the chemical changes in disc following endplate fracture.

Keywords(AVH-VKA- PVBA- lumbar vertebral)

Acknowledgment

This work would not have been possible without the guidance and the help of several individuals who in one way or another contributed and extended their valuable assistance in the preparation and completion of this study.

First and foremost, my utmost gratitude to **prof.Dr. Ahmed Morrah** for giving me the advantage of working under his supervision. He saved no effort to guide me in every aspect. His advice, valuable suggestions and criticism had a profound impact om my career.

Dr . Hossam Salah who has been a fatherly support ever since I entered the orthopaedic department and till now.

Dr . Ihab Mohamed Emran who took the time and effort to pass on their knowledge and experience, and their guidance through every step of this study.

I would like to express my great appreciation to all staff members of the Orthopaedic department, Faculty of medicine, Cairo University, for their support and encouragement, and also my colleagues for their support and advice.

I would like to thank my wife for her personal support and great patience at all times. My parents ; My father who has always been a role model and a guide through every stage in my life.

Above all , I thank ***Allah***, for answering my prayers and for giving me the strength and will to go on.

Mohamed mosaad marouf

List of tables

List of figures

List of abbreviations

CER	Central endplate region
RA	Ring apophysis
ASIA	American soinal injury association
SCI	Spinal cord injury
ISNCSCI	International Standards for Neurological Classification of Spinal Cord Injury
AVH	anterior vertebral height
PVH	posterior vertebral height
VKA	vertebral kyphotic angle
PVBA	posterior vertebral body angle
CDA	cross-diagonal angle
TLICS	Thoracolumbar injury classification and severity score
PLL	Posterior longitudinal ligament
BAER	balloon-assisted endplate reduction
CPC	calcium phosphate cement
VBS	vertebral body stenting
PMMA	polymethylmethacrylate
VAS	visual analogue scale
ODI	Oswestry disability index
SD	Standard deviation
RT	right

LT	left
Ant/post	Anterior/posterior

Introduction

Spinal column injuries represent approximately 3% of all trauma cases(1) and 90% of these injuries involve the thoraco-lumbar region.(2) The thoraco-lumbar segment of spine (D10 to L2) is an unstable zone between fixed dorsal and mobile lumbar spine.

Most often, damage occurs from a combination of different forces. Pure axial loads, or compressive forces, have been shown to result in end plate fractures as under compression the discs are always stronger than the endplate and that compression forces create a fracture of the endplate before damage to the intervertebral disc(3)

Recurrent kyphosis after posterior reduction was commonly seen with posterior instrumentation and appears to be a result of creeping of the nucleus pulposus back into the depressed central area although it can be argued that eventually discs adjacent to fractures will degenerate, such as are seen in degenerative disc disease, but the degree of kyphosis observed after longer follow-up does not seem to be greater than that at two years(4) .

Posterior reduction probably reduces only the periphery of the endplate with its strong annular attachments while the central area remains depressed. After removal of the internal fixation(without fusion), the disc settles in this depressed area causing narrowing of the disc space and amplifying the residual kyphosis.

Anterior approach or Combined anterior and posterior can allow better control of kyphosis,but higher morbidities with anterior approach .

Transpedicular spongioplasty may restore depression of the endplate and prevent creeping of the disc.(5) Most of the central depressions occur in the posterior half (4,5,6).