MANAGEMENT OF CERVICAL SPINE INJURIES (CLINICO RADIOLOGICALS AND OPERATIVE STUDY)

THESIS

Submitted for the partial fulfillment of the M.D. in NEUROSURGERY

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سُبحانكَ لاَ علمَ لنَا إلَا مَاعلَمتنا إنكَ أنتَ
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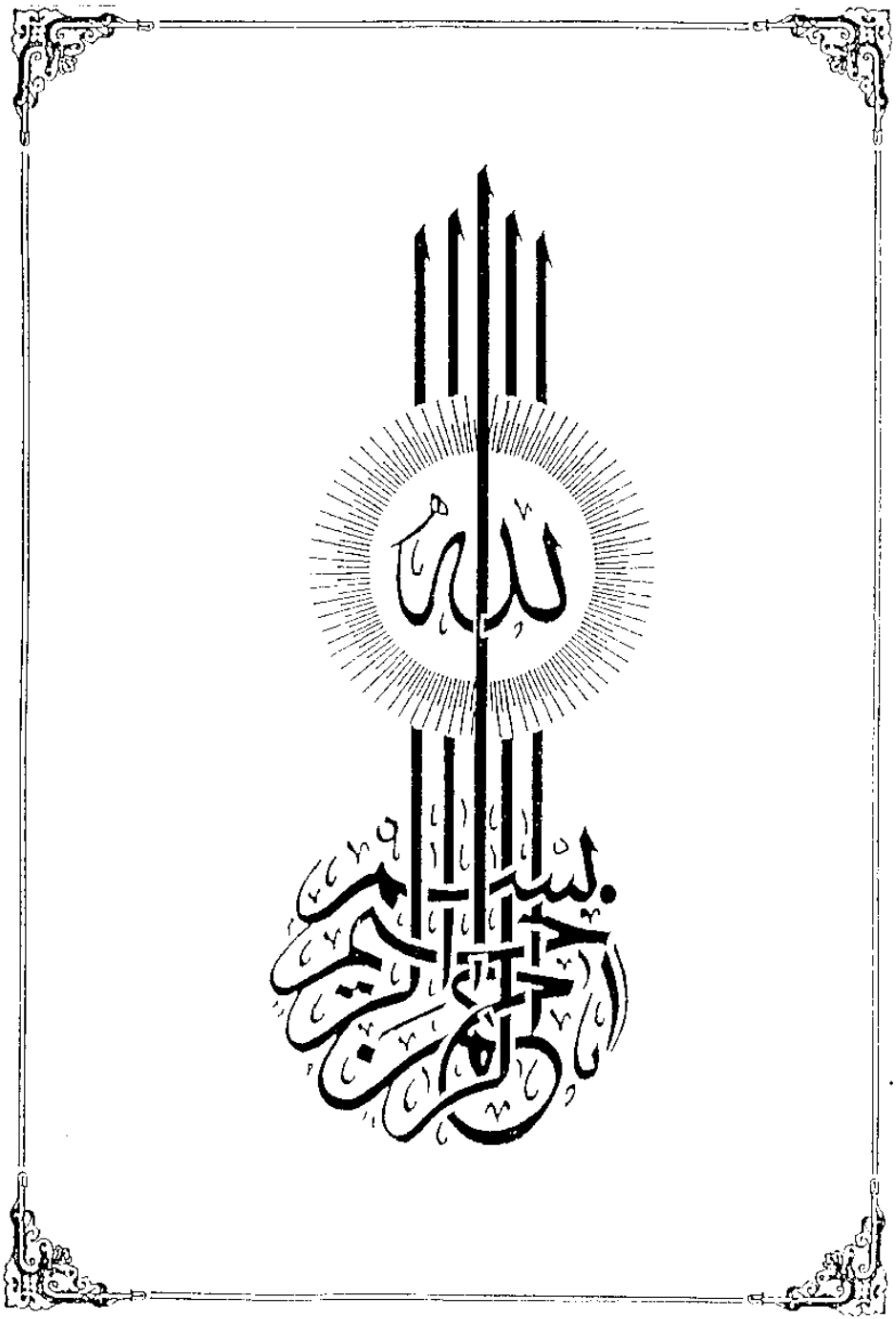

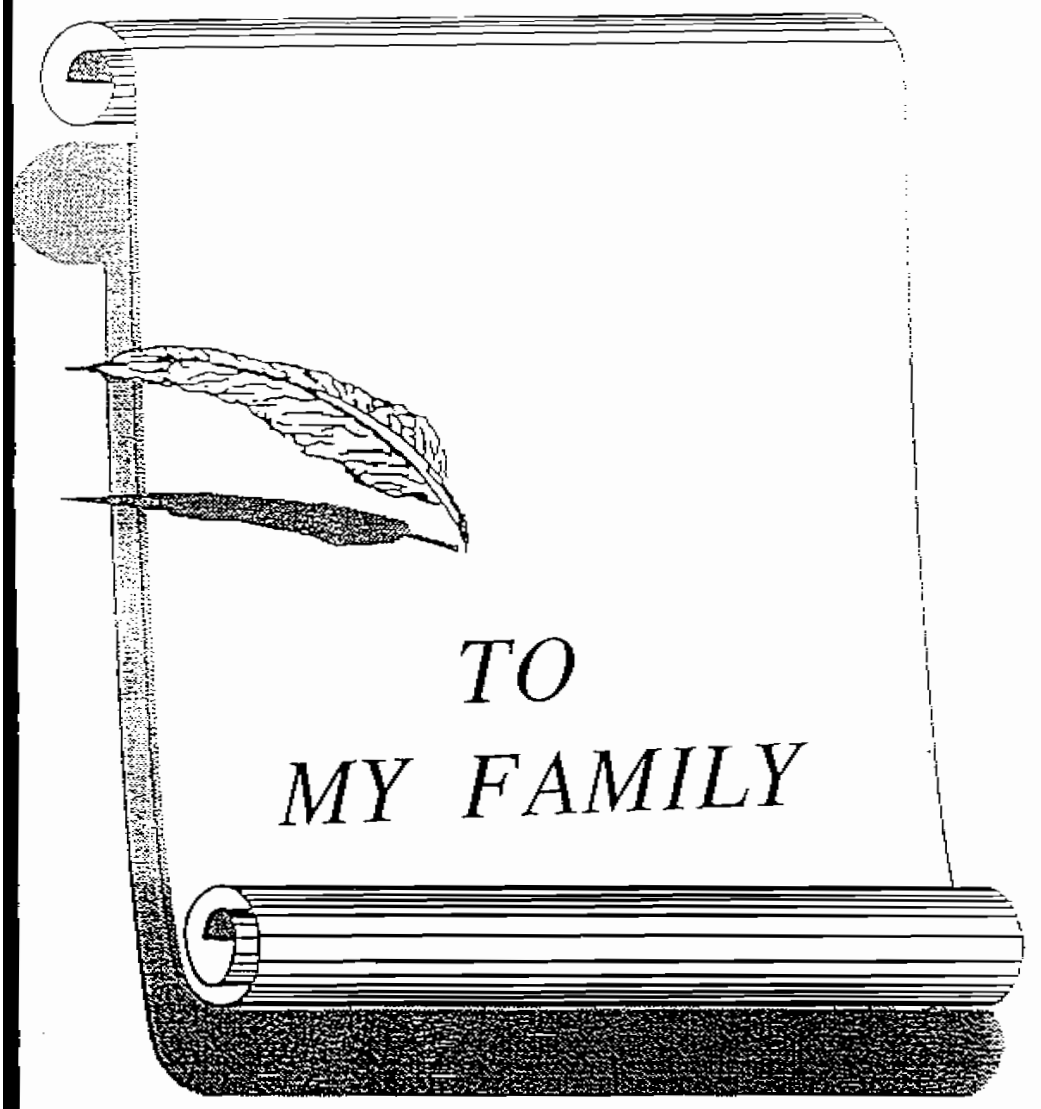
TO
MY FAMILY

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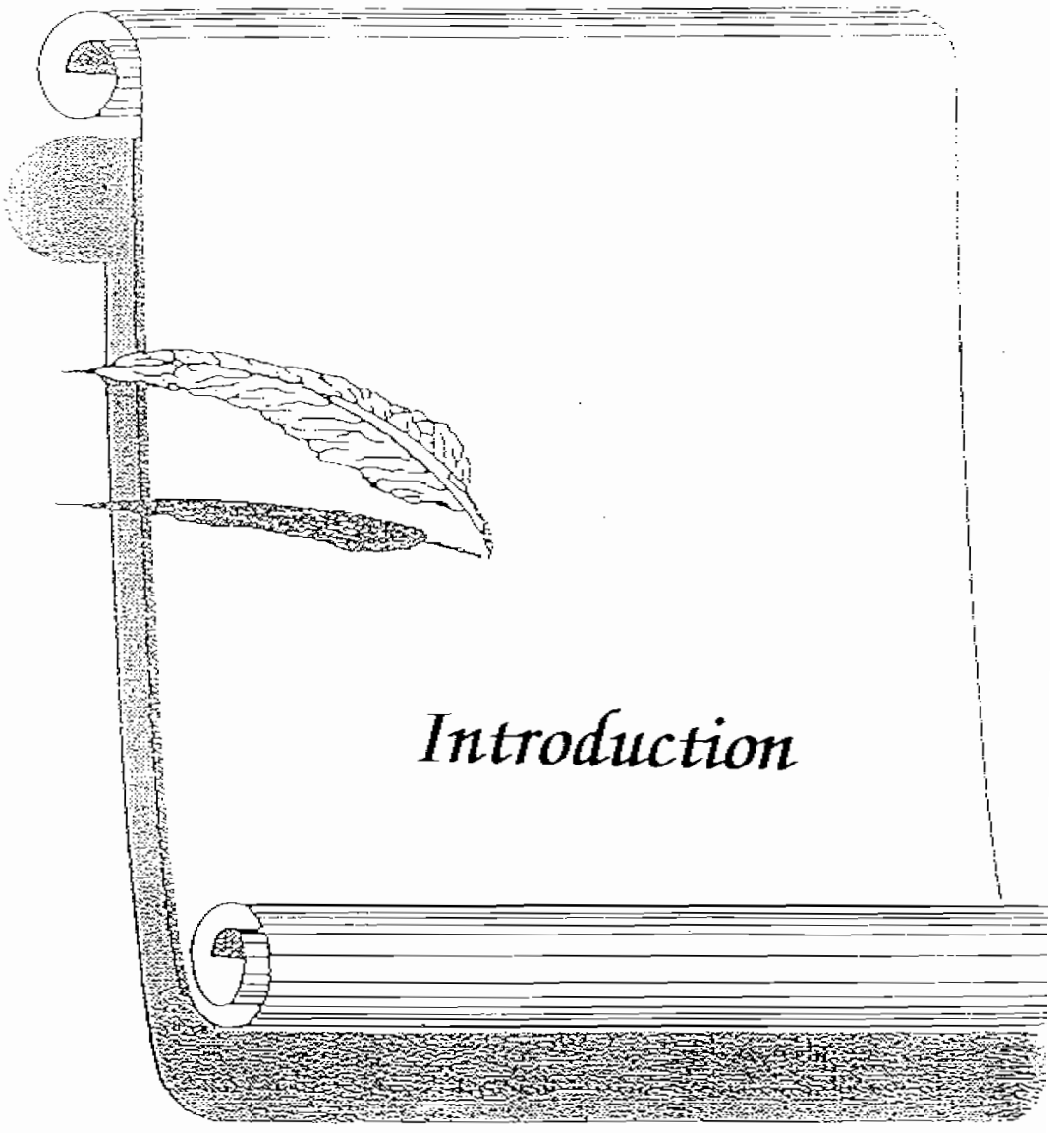


Introduction

INTRODUCTION

The first reference to fracture of the spine was found in Edwin Smith's Papyrus written about 5,000 years ago by ancient Egyptian physician, Imhotep.

The writer stated "one having a crushed vertebra of his neck he is unconscious of his neck, he is unconscious of his two arms and his two legs and he is speechless." An ailment not to be treated: he identified sprains, vertebral subluxation, and dislocations.(146)

Hippocrates (460-370B.C.) He did not believe that anything could be done to correct the spinal deformity in living individuals. He noted that fractures of spinous processes seldom fatal and deplored the lack of adequate treatment for forward dislocation of the vertebral body. (28,146)

In 30 B.C., Celsus noted that death quickly followed when the spinal injury involved the cervical area. Galen probably introduced the earliest spinal cord surgery.

Paul of Aegia (625-690) wrote of the spinous process is broken off, it will be felt by examination with the finger, and you must make an incision of the skin and extract it.

"Ambroise Pare" (1510-1595) advocated the cure or spinal dislocation by traction fabricius Hildanus 1646 describe the use of forceps in treating fracture dislocation of cervical spine. (146)

In 1814 Cline carried Laminectomy but the patient died nine days later. After that the treatment of spinal injuries was conservative and only a few support operative treatment. (146)

Cushing (30) in 1905, formulated indication and contraindication for spinal operation, he classified the patients into three categories:

1. Cases in which operation is contraindicated because it would not benefit the patient and might increase the damage (e.g. hematomyelia)

2. Cases of fracture dislocations unlikely to benefit from operation.

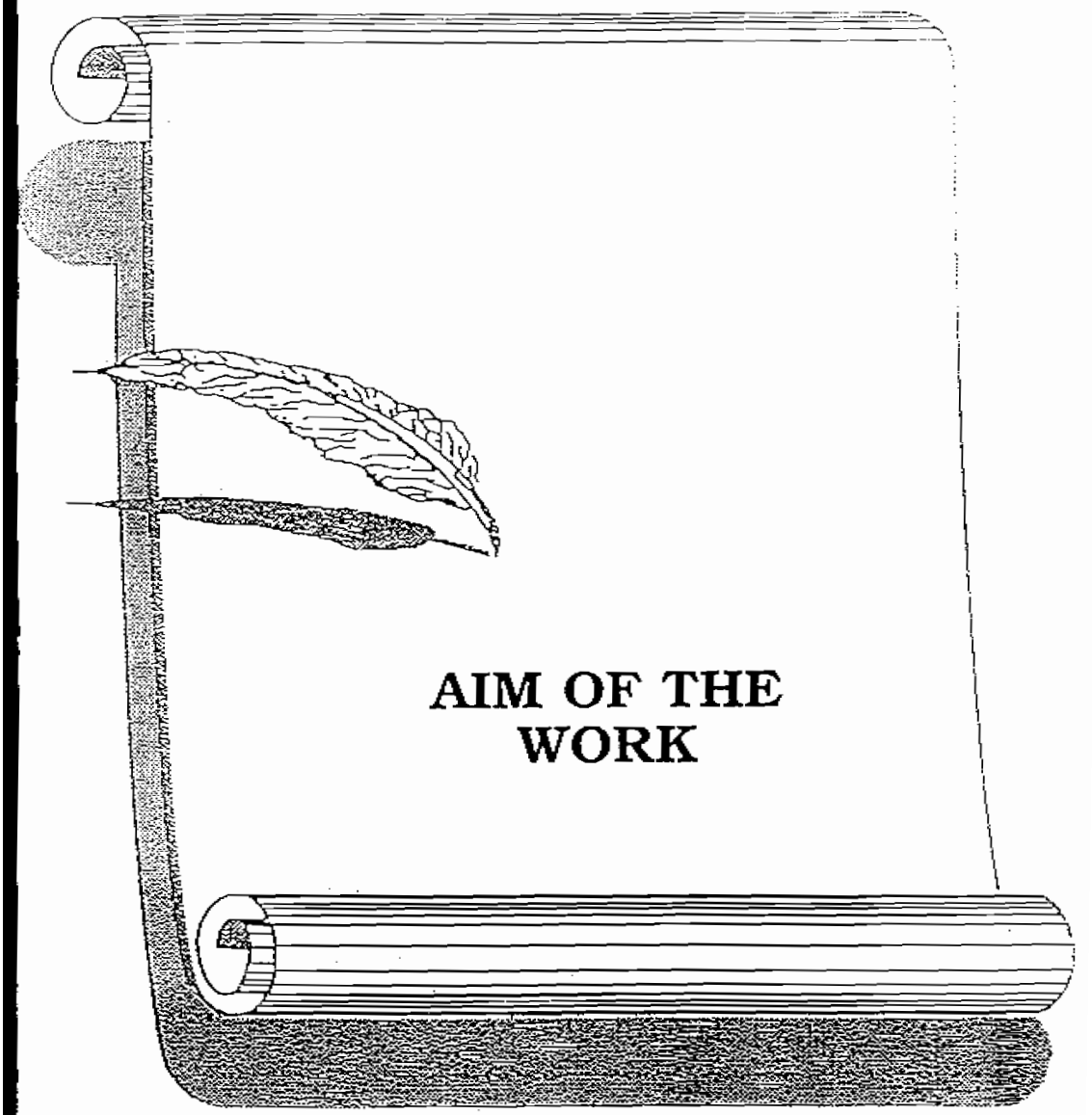
3. Cases with partial spinal cord lesions from a piece of bone or bullet the operation would likely benefit.

Fleming's (1929) discovery of penicillin improved the management of individual with spinal trauma.

In 1932 Crutchfield[39] developed his famous tongs. Later on, Gardner-Willis Tong and other tongs with modification were introduced for skeletal traction. [93] Stryker turning frame developed in the late 1930's by Homer Stryker.

The halo developed by Nickel and his group in 1959, represented an important advance in the treatment of cervical fractures it makes early mobilization and ambulation possible. [93]

Recently due to the great development in surgery, improved anesthesia, improved diagnostics' modalities including computed tomography and magnetic resonance imaging, better visualization via the microscope, more sophisticated instruments, improved spinal instrumentation, and establishing centers for rehabilitation all enhance the treatment of cervical injuries and improving morbidity.



AIM OF THE WORK

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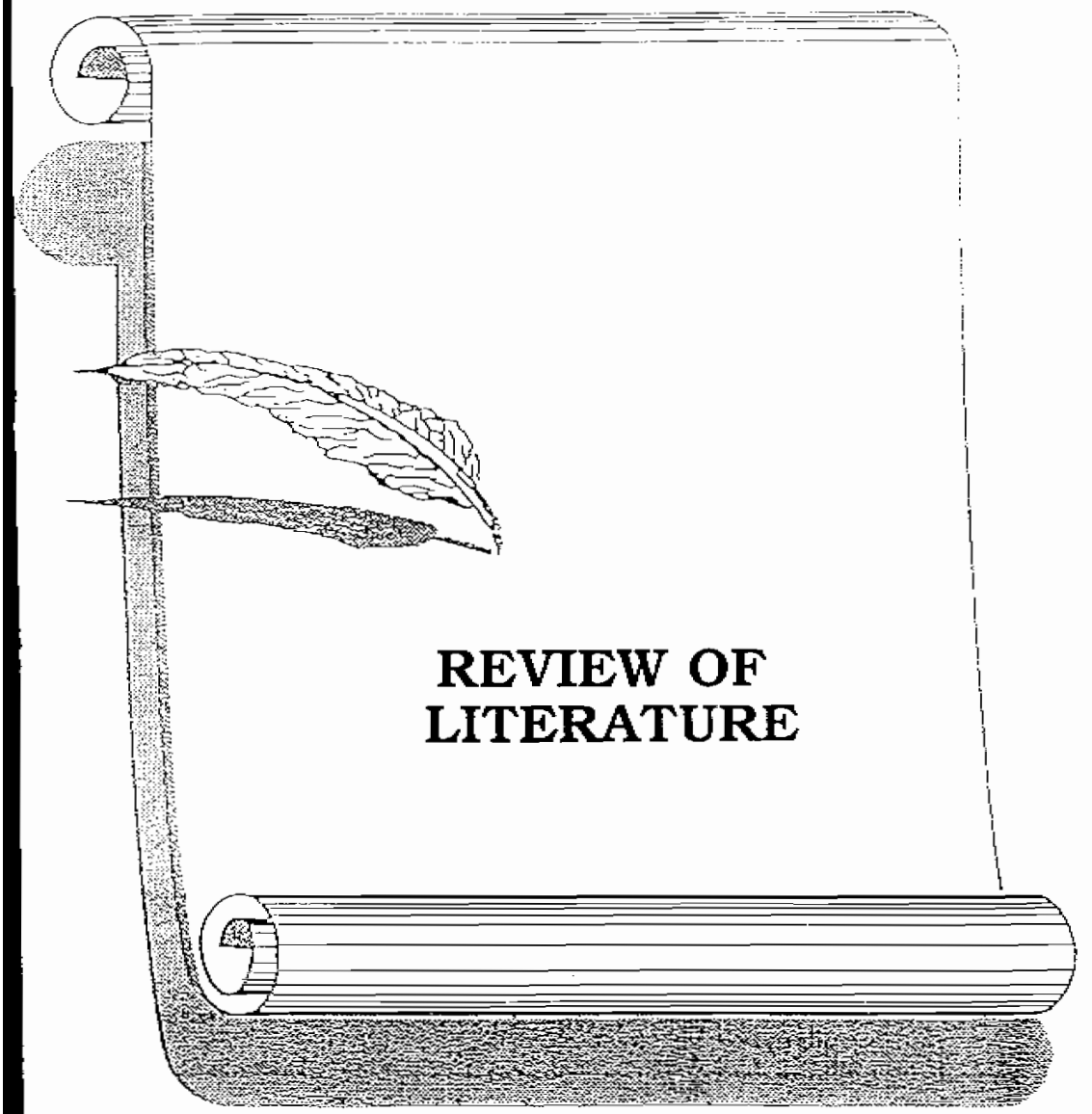
The aim of the work is to study cases of cervical spine injuries and different modalities of management and factor affecting the outcome.



REVIEW OF LITERATURE

ANATOMY OF THE CERVICAL SPINE

A review of the normal anatomical features and relationships of the cervical spine enables one for better understanding the mechanisms of injury and factors involved in trauma of this region. So, complete familiarity with this region is essential for dealing with injuries of the cervical spine.

Components of the cervical spine:

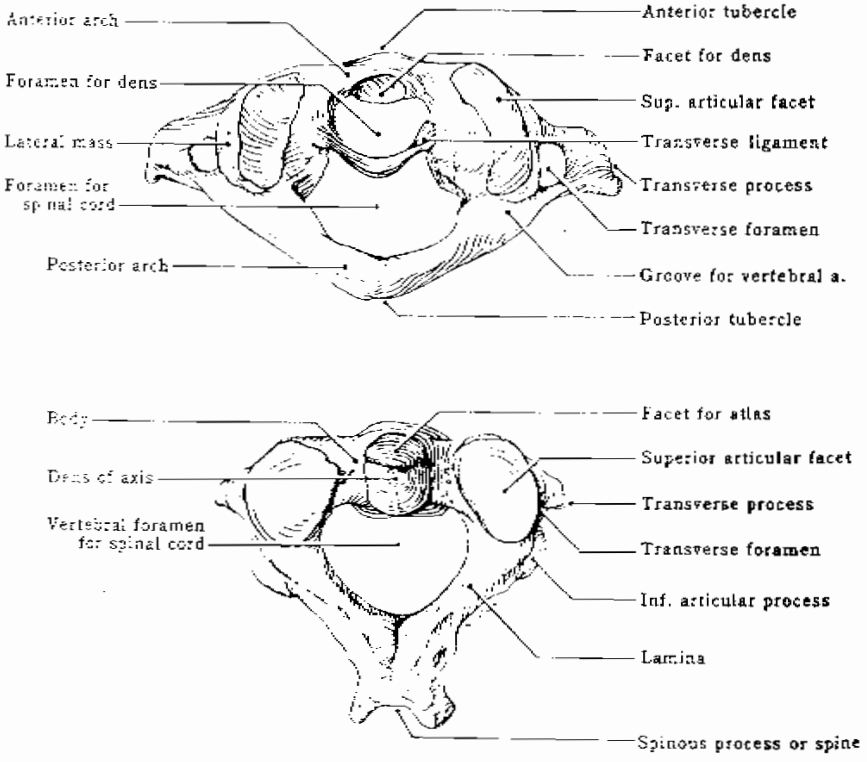
1. Osseous component.
2. Joints and ligaments.
3. Spinal canal and its neural contents.
4. Blood supply (vascular contents).

OSSEOUS COMPONENTS

The average length of the adult vertebral column is approximately 71cm and the cervical spine accounts for 12.5 c.m The cervical spine is a true movable segments of the vertebral column, containing seven vertebrae and makes forward convexity (lordosis). The cervical vertebrae are the smallest of the true vertebrae and re readily distinguished from the other vertebrae by the foramen transversarium, in each transverse process .

The first, second, and the seventh cervical vertebra have certain features and are called atypical

cervical vertebrae, while the third, fourth, fifth and the sixth are called typical cervical vertebrae. (37)



ATLAS AND ITS TRANSVERSE LIGAMENT AND THE AXIS, FROM ABOVE

1. Typical cervical vertebrae:

It has a small and oval or (broad kidney-shaped) vertebral body. It's transverse diameter is greater than the anteroposterior one. The upper surface is concave transversely and has a projecting lip, the uncinate process, on either side. The lower surface is convex from side to side with beveling laterally which receive the uncinate process of the vertebra below, forming the neuro-central synovial joint. The upper and lower surfaces, each covered with a plate of hyaline cartilage, give attachment to the intervertebral disc.

The pedicle is attached to the body below the upturned lips. Thus an intervertebral foramen in the cervical spine is bounded in front by both vertebral bodies and synovial joint and disc between them. Attached to the pedicle and the body is the lateral projection of the transverse process, perforated by the foramen transversarium, which transmit the vertebral artery and vein accompanied by a plexus of sympathetic fibres from C6 to C1.

The laminae encloses a relatively large spinal canal, somewhat triangular in cross section. Their borders are grooved for ligamenta flava. At the junction of the pedicle and lamina, there are upper and lower articular processes, carring facets. The upper facets face up and back. The lower facets face down and forward. The spinous process is usually bifid, and excavated inferiorly. (92,96)

2. Atypical cervical vertebrae:

The first (Atlas) and second (Axis) cervical vertebrae are atypical in many aspects, both structural and functional. Weight-bearing between them and the skull is not by way of the vertebral bodies, and their joints permit a much wider range of movement than elsewhere in the vertebral column.