SKULL BASE FRACTURE CASE STUDIES

A Thesis
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General Surgery

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بسم الله الرحمن الرحيم

سبحانك لا علم لنا إلا
ما علمتنا إنك أنت
العليم الحكيم

صدق الله العظيم
سورة البقرة ٣٢

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Review of Literature

Contents

Introduction

INTRODUCTION

Basilar skull fractures are not uncommon findings in acute head injury. Although these fractures may occur in association with different type and variable degrees of head injury, this peculiar type of fracture deserves to be considered as a separate entity from other cranial and intraccranial injuries because of its specific mechanism, unique complications and therapeutic implications.

Little attention has been paid to fracture base in general and to the mechanism of trauma leading to its occcurence especially in recent literature.

Basilar skull fracture should be suspected in patients who have sustained head trauma and present with periorbital and / or eye lid ecchymosis without history of direct orbital trauma, C.S.F rhinorrhoea or otorrthoea, acute loss of smell, acute loss of hearing in one or both ears, Battle's sign, haemotympanum or laceration of the external autditory canal without a history of direct truama to the ear.

Fractures involving the sinuses may also leads to intracranial infection, the onset of infection can be delayed occasionally for years following the injury but the onset is usually within the second week. Some people place patients with basilar skull fractures on antibiotic coverage routinely as a resonable practice at least untill the leakage is controled. Antibiotics should be given for patients with pneumocephalus noted on skull film or C.T.

Sometimes there is associated cranial nerves deficit especially the seventh, eighth cranial nerves and the otolaryngiologist should be notified early in the course of the treatment.

If there is clinical evidence of a basilar skull fracture, radiographic evidence is not crucial. It is difficult to detect most such fractures with plain skull film, C.T. scanning being much more sensitive.

THE AIM OF THE WORK :

No attention before was paid for changes in the blood picture especially the variation of the total leucocytic count and differenial count with erythrosedementation rate (E.S.R) in skull base fractures and its relation with the final outcomes of the patients and with the best motor response for this type of injury.

Anatomy

ANATOMY OF SKULL BASE

The base of skull is in three levels. like steps of staircase, and these are called, anterior, middle and posterior cranial fossae :

A- The anterior fossa lodges the frontal lobe and its floor in level with the upper margin of the orbit.

B- The middle fossa lodges the temporal lobe and its floor is at level with the upper border of the zygomatic arch.

C- The posterior fossa lodges the brain stem and cerebellum.

THE ANTERIOR FOSSA

Lies highest of the three, its posterior boundary is sharp concavity made by the lesser wing of sphenoid. Laterally the lesser wing meets the frontal bone and greater wing of sphenoid in the posterior border is continued to the side wall of the skull at the pterion from the nose up to 20 olfactory nerves perforate the dura mater and arachnoid mater over the cribriform plate and stream back in subarachnoid space to enter the olfactory bulb from which the olfactory tracts pass back to the inferior surface of the frontal lobe.

The olfactory fossa forms the lowest part of the floor of the anterior cranial fossa it is bordered by the crista galli.

(LANG - 1989)

THE FLOOR OF THE ANTERIOR CRANIAL FOSSA

The floor of the anterior cranial fossa is the part of the interior of skull base which supports most of orbital loba of the cerebrum, olfactory bulbe, and the olfactory tract, the orbital parta of the frontal bone form the greater portion of the floor of the anterior fossa.

Between them is the ethmoid bone with the cribriform plate the posterior floor region is completed by the lesser wing of the sphenoid the optic canal and by the planum sphenoidale.

(LANG - 1970)

CRIBRIFORM PLATE OF THE ETHMOID

Which streches actoss the median plane. lies between the two orbital parts of the frontal bone, is depressed below the level of the rest of the floor. It separates the fossa from the Nasal Cavity. cristi-galli is a median crest like elevation which project upwards between the two cerebral hemispheres.

Cristagalli gives attachement of falx cerebri the numerous skull foramina which perforate the cribriform plate transmit the minute olfactory nerves from the nasal mucosa to the olfactory bulbe. Posteriorly the cribriform plate articulates with the body of the sphenoid at the spheno ethmoidal suture.

(GRAY'S - 1976)

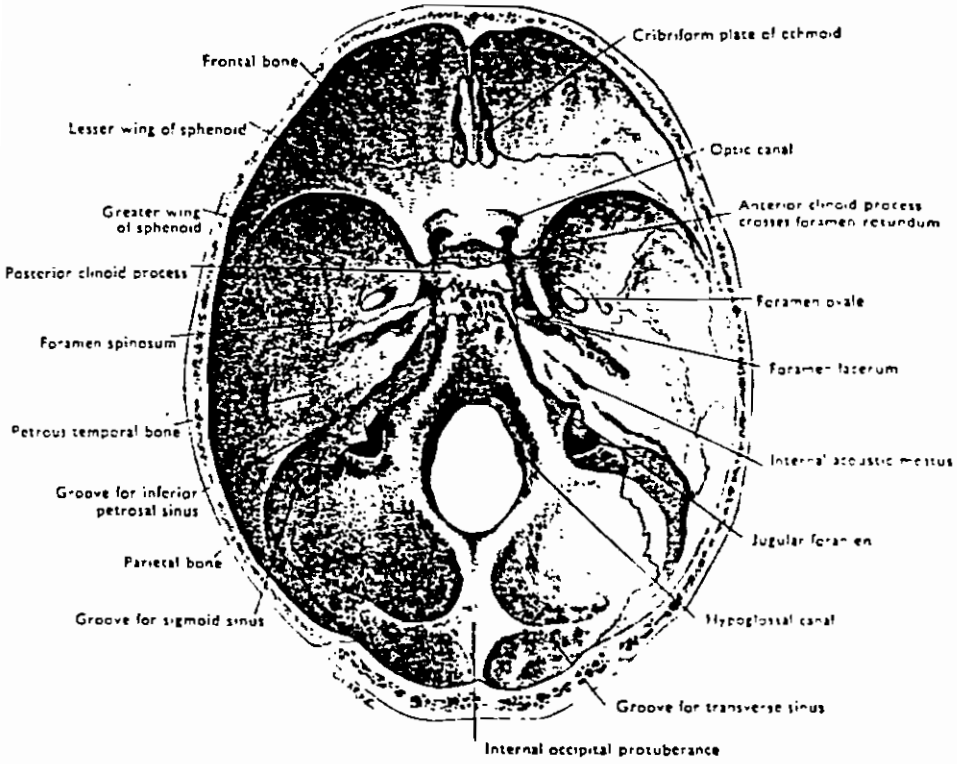

FIG. 39 Internal surface of the base of the skull.

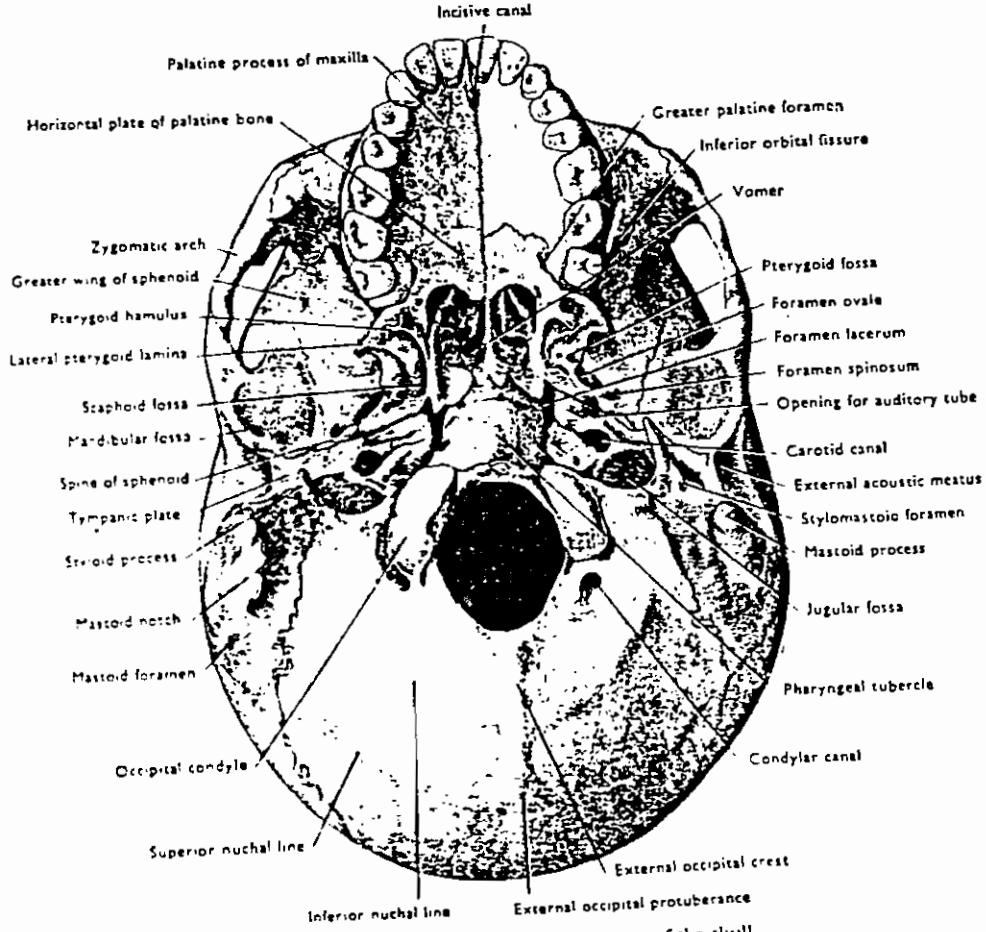

FIG. 93 The external surface of the base of the skull.

THE ORBITAL PART OF THE FRONTAL BONE

It forms the greater part of the part of floor of the anterior fossa on each side of median plane and separate the orbital conntents from the inferior surface of the frontal lobe of the brain. Its cranial surface is convex and marked by impression for cerebral gyri and by one or two small grooves by meningeal vessels .

(GRAY'S - 1976)

THE SPHENOID BONE

Completes the posterior margin of the floor of the anterior fossa. Centerally the upper surface of its body, termed as (jugium sphenoid). This separates the fossa from an air space in the body of sphenoid (sphenoid air sinus). Anteriorly the jugium articulatrs with the post erior margin of cribriform plate. Posteriorly it is limited by the anterior border of the groove be termed (sulcus chiasmatis). Lateral to jugium the floor of the anterior fossa is formed by the lesser wing of sphenoid. The medial extremity of its posterior border formes a projection is termed (anterior clinoid process). Medially by the lesser wing is connected to the body of sphenoid by two roots separated from each other by the (optic canal). The cristigalli and the frontal crest afforded attachement to the falx cerebri.

(GRAY'S - 1976)

DURA MATER OF ANTERIOR CRAIAL FOSSA

The dura mater of the anterior cranial fossa is composed of two layers between them the larger branches of the dural vessel which give off small branches to the cranium and to the dura itself.

The major vessseles of the dura (and the bone of anterior fossa) are the ethmidal arteries and the frontal branches of the middle meningeal also the falx carries a relatively large branch of anterior ethomidal artery called anterior falceal artery.

Venous drainge from dura generally follow the course of dural arteries.

(LANG - 1989)

THE MIDDLE CRANIAL FOSSA

It is a butterfly shaped, the small body of the butterfly is the body of sphenoid.

The body of the sphenoid is centrally hollowed out into (sella turcia) (turkushsaddle) with lump infront called the (tuberculum sellae).

At the back of transverse flange projects up called the dorsum sallae (the back of saddle).

The upper border of the dorsum sellae end at each side as posterior clinoid processes.

(LAST - 1985)

It is shoud be noted the foramen rotundum, foramen ovale foramen spinosum, foramen vesilius on the right side of the head are placed closer to the midsagittal plane than on the left side. furthermore the foramina on the right are set slightly farther posteriorly than on the left.

The anterior wall of the floor of middle fossa carries a depression adapted to the pole of the temporal lobe.

(LANG - 1989)

CONTENS OF MIDDLE CRANIAL FOSSA

Middle cranial fossa contatins pituitary gland trigeminal ganglion, second, third, fourth, fifth and sixth cranial nerves leaving the skull through foramina in the fossa.

(LAST - 1984)

THE POSTERIOR CRANIAL FOSSA

It is the largest and deepest of the cranial fossae. Bounded in front by the dorsum sellae, the posterior part of the body of the sphenoid and the basilar part of the occipital bone.

Behind by the lower part of squamous part of the occipital bone. On each side by the petrous and mastoid part of the temporal bone and the lateral part of occipital bone. Above and behind by a small part of mastoid angle of the parietal bone.

(LANG - 1989)