

CHAPTER III

RESEARCH METHODOLOGY

Target Population and Sample Population

Adult human dried skulls

Sample selection

Adult human dried skulls were all in the department of anatomy, faculty of medicine, Chulalongkorn university. The gender was identified by standard method of forensic medicine [20]. The included skulls should have no bony defect of the studied region.

Sample Size Determination

In pilot study, 10 orbits (5 dried skulls, 2 males and 3 females) were measured. The standard deviation of the distance between the orbital rim just above the infraorbital foramen and the posterior margin covering of infraorbital nerve (= 3.60 mm) was calculated for sample size.

Continuous response variable and one-sample problem

$$n = Z_{\alpha/2}^2 \sigma^2 / d^2$$

where; $Z_{\alpha/2} = Z_{0.05/2} = 1.96$ (two tail) at 95% CI

$$\sigma^2 = \text{variance} = (3.60)^2$$

d = Acceptable error = 1.00 mm

so; $n = Z_{\alpha/2}^2 \sigma^2 / d^2$

$$n = (1.96)^2 (3.60)^2 / (1.00)^2$$

$$n = 49.79$$

The sample size was at least 50 orbits.

For the comparison between gender and side, 100 orbits (50 skulls) were used (50 males and 50 females).

Materials

Electronic Caliper (BAKER type EC - 10) (Figure 1)

Spinal block needle

Circle

Adult human dried skulls

Pencil

Methods

Orbital measurements

The distances from the 4 constant landmarks on the orbital rim to the orbital apertures were determined on each orbit.

On medial wall, the constant landmark is the midpoint of the anterior lacrimal crest. The following distances were measured. (Figure 2 , 3)

1. anterior lacrimal crest - posterior lacrimal crest
2. anterior lacrimal crest - anterior ethmoidal foramen
3. anterior lacrimal crest - posterior ethmoidal foramen (farthest)
4. anterior lacrimal crest - optic canal (medial aspect)
5. anterior ethmoidal foramen - optic canal (medial aspect)
6. anterior ethmoidal foramen - posterior ethmoidal foramen
(farthest)
7. posterior ethmoidal foramen - optic canal (medial aspect)



8. distance of anterior ethmoidal foramen above frontoethmoid suture line (if it is found.)

On the superior wall or roof, the constant landmark is the supraorbital notch or foramen. The following distances were measured. (Figure 4)

1. supraorbital notch or foramen - closest margin of superior orbital fissure
2. supraorbital notch or foramen - optic canal (superior aspect)
3. supraorbital notch or foramen - lacrimal foramen (if it is found.)

On the inferior wall or floor, the constant landmark is the orbital rim just above the infraorbital foramen. The following distances were measured. (Figure 5)

1. orbital rim above infraorbital foramen - closest margin of inferior orbital fissure
2. orbital rim above infraorbital foramen - optic canal (inferior aspect)
3. orbital rim above infraorbital foramen - posterior margin covering of infraorbital nerve

On the lateral wall, the constant landmark is the frontozygomatic suture. The following distances were measured. (Figure 6)

1. frontozygomatic suture - closest margin of superior orbital fissure

2. frontozygomatic suture - closest margin of inferior orbital fissure
3. frontozygomatic suture - optic canal (lateral aspect)
4. frontozygomatic suture - lacrimal foramen (if it is found.)

Statistical analysis

Statistical analysis was undertaken with SPSS version 13. The data of measurements were analyzed by descriptive statistics as means and standard deviations. The comparison between genders and sides was assessed by Student's *t* test. The p-value of less than 0.05 was set for the significant difference.



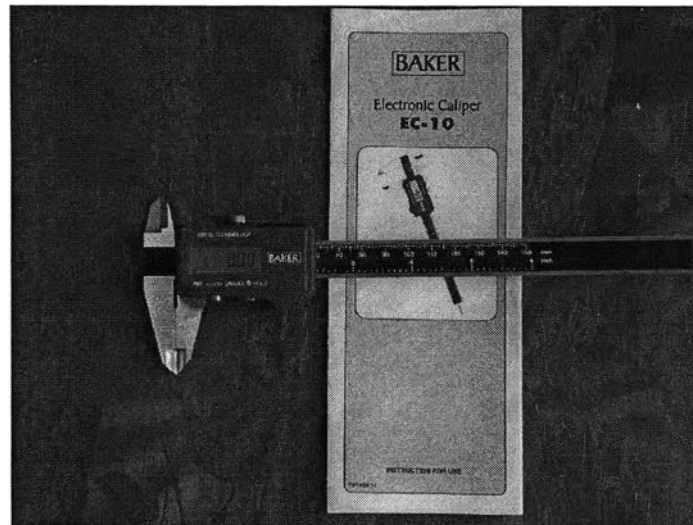


Figure 1. The Electronic Caliper (BAKER type EC-10)

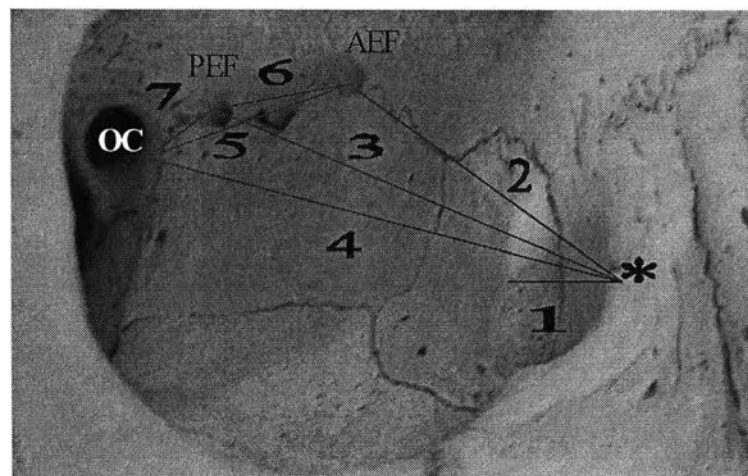


Figure 2. The medial wall measurements in the right orbit (* = the midpoint of the anterior lacrimal crest, OC = optic canal, PEF = posterior ethmoidal foramen, AEF = anterior ethmoidal foramen)

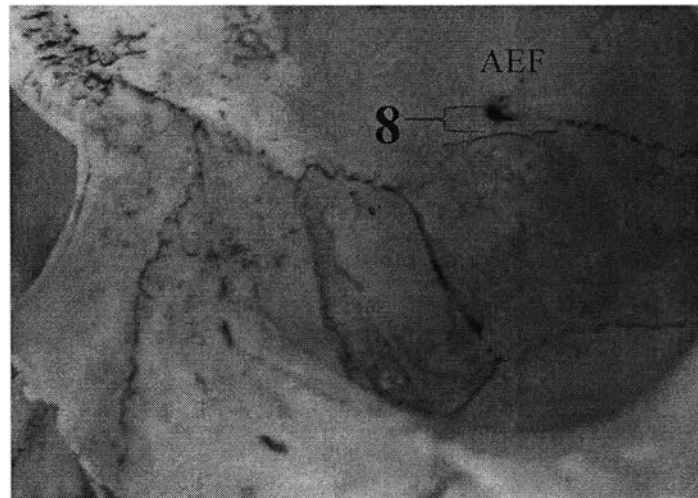


Figure 3. the anterior ethmoidal foramen above the frontoethmoid suture line (AEF = anterior ethmoidal foramen)

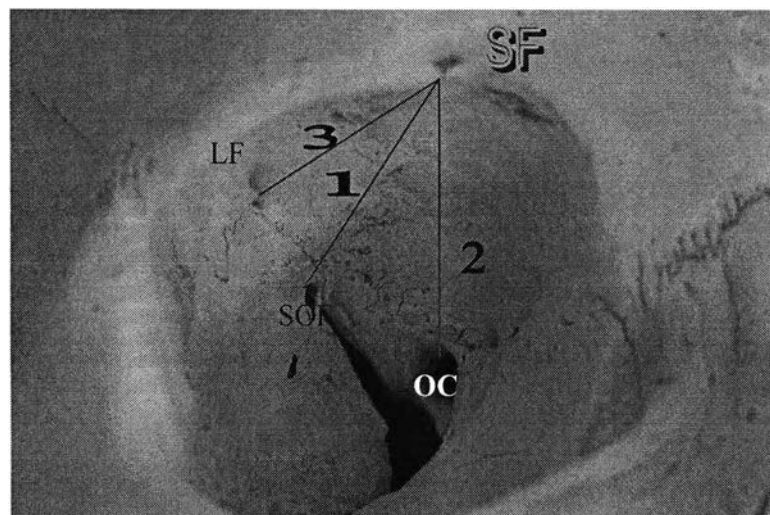


Figure 4. The superior wall measurements in the right orbit (SF = supraorbital foramen, LF = lacrimal foramen, SOF = superior orbital fissure, OC = optic canal)

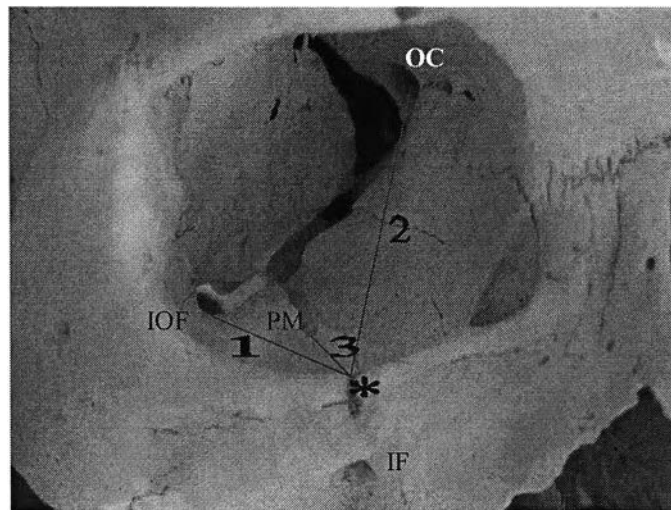


Figure 5. The inferior wall measurements in the right orbit (* = the orbital rim above the infraorbital foramen, IF = infraorbital foramen, IOF = inferior orbital fissure, PM = posterior margin covering of infraorbital nerve)

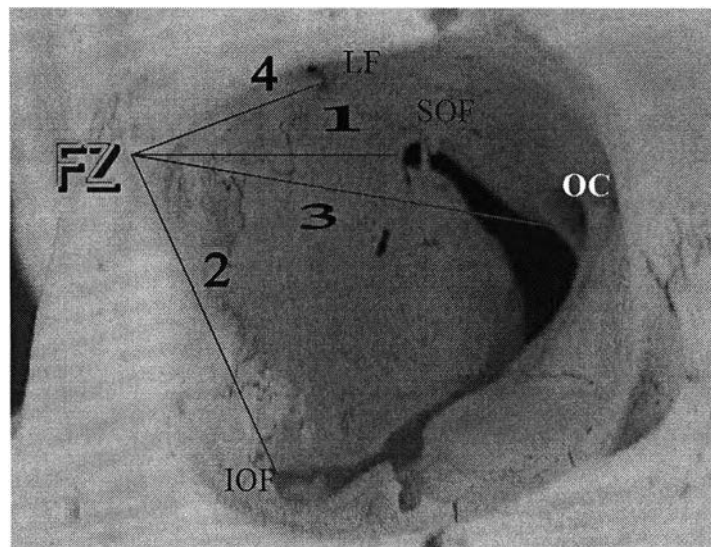


Figure 6. The lateral wall measurements in the right orbit (FZ = frontozygomatic suture, LF = lacrimal foramen, OC = optic canal, IOF = inferior orbital fissure)