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Morphometric Evaluation, Locational Relationship, and Surgical Significance of the Maxillofacial Region Landmarks

Evaluación Morfométrica, Relación de Ubicación e Importancia Quirúrgica de los Puntos de Referencia de la Región Maxilofacial

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SUMMARY: The aim of this study was to examine the localization of the landmarks in the maxillofacial region and their relations with each other and to evaluate them morphologically and clinically. Our study included 41 dry adult human skulls of unknown age and sex of Anatolian population. Statistical analysis of the data obtained in our study was performed with SPSS v.20.0 software (IBM Corp., Armonk, NY, USA). Statistical significance was accepted as $P \leq 0.05$. Whereas the mean right supraorbital depth (SOD) value was significantly greater than the mean left SOD value ($p < 0.05$), no significant difference was found between the right and left sides in all other measurements ($p > 0.05$). Correlation values in our study varied between -0.156 and 0.612. The highest correlation value was obtained in the positive direction between the orbital height (OH) and supraorbital foramen–infraorbital foramen (SOF–IOF) measurements ($r = 0.612$, $p < 0.001$). We believe that measurements of the orbit, SOF, and IOF and our data on their localizations, along with the relationships that we observed in our study will allow surgeons to avoid damaging the neurovascular bundles during surgical interventions and local anesthesia procedures in the frontal, periorbital, and maxillofacial regions.

KEY WORDS: Supraorbital notch/foramen; Infraorbital foramen; Morphometric measurements; Maxillofacial surgery.

INTRODUCTION

Knowing the location of important structures and reference points in the orbital, maxillary and nasal regions of the skull provides important data for surgical interventions such as maxillofacial surgery, aesthetic plastic surgery, periorbital surgery, and local anesthesia. In addition, acquiring thorough knowledge of the anatomy of this region is the most effective way to avoid damaging maxillofacial structures (Hwang & Baik, 1999; Aziz *et al*., 2000; Chrcanovic *et al*., 2011).

In surgical procedures performed due to periorbital injuries, utmost care should be taken to prevent damage to the neurovascular structures in the orbit or its walls. Moreover, safe administration of anesthesia to the orbital region is highly dependent on an accurate understanding of orbital anatomy and its components. This helps in preventing harmful effects following injury to structures such as the optic nerve. Therefore, it is important to consider the upper and lower orbital depths during deep orbital surgery to avoid damage to the optic nerve (Munguti *et al*., 2012).

The supraorbital notch/foramen (SOF) is a long bony opening above the orbit and below the forehead. Sometimes this cavity is incomplete and is called the supraorbital notch, through which the supraorbital nerve, artery, and vein pass. The supraorbital nerve provides sensory innervation of the lateral forehead, skin and conjunctiva of the upper eyelid, and frontal sinus mucosa (Chrcanovic *et al*.; Tortora & Derrickson, 2011). To avoid causing damage to the neurovascular bundle that comes out of the orbit during surgeries and aesthetic surgery procedures, its exit points should be well-known to the surgeon (Agthong *et al*., 2005; Apinhasmit *et al*., 2006; Aksu *et al*., 2007).

The infraorbital foramen (IOF) is located under the infraorbital rim in the maxilla and the infraorbital nerve, vein, and artery pass through it. The branches of the infraorbital nerve, which is the continuation (branch) of the maxillary nerve, innervates part of the nose, skin of the upper cheek, skin and conjunctiva of the lower eyelid, skin and mucosa of the upper lip, maxillary sinus mucosa,

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maxillary incisor, canine, premolars, and adjacent upper gums (Moore & Dalley, 1999; Chrcanovic *et al*.; Przygocka *et al*., 2012). IOF and infraorbital neurovascular bundles are important structures that should be considered in surgical interventions in the oral and maxillofacial regions. Knowing the localization of these structures is very important to prevent clinical complications such as entrapment neuropathies, painful neuralgias, bleeding, and loss of sensation in the related areas of the face (Gupta, 2008; Chrcanovic *et al*.; Przygocka *et al*.).

In previous studies it has been reported that, the localization and measurement parameters of the landmarks in this region vary based on populations. Meanwhile, it has been observed that there are not enough studies in Anatolian population in which measurements of orbital, SOF, and IOF regions were examined in detail anatomically and clinically and compared with other studies.

In this study, it was aimed to examine the localization of the formations in the maxillofacial region (orbit, IOF and SOF) and to evaluate their relationship among one another, on a morphological and clinical basis.

MATERIAL AND METHOD

In our study, we studied 41 dry adult human skulls of unknown age and sex of the Anatolian population, which were maintained at the Department of Anatomy, Çukurova University Faculty of Medicine and the Department of Anatomy, Harran University Faculty of Medicine. Skulls with any fractures, deformities, damage, or problems affecting measurements in the maxillofacial region and orbit were not included in the study. To check for intra-observer errors, all measurements were done twice by the same person, and the mean values were recorded. Stainless steel digital caliper with 0.01-mm precision was used in the measurements. Anthropometric measurements were calculated as follows (Fig. 1):

Superior orbital depth (SOD): The distance from the supraorbital foramen/notch to the superior aspect of the orbital opening of the optic canal.

Inferior orbital depth (IOD): The distance from the point on the inferior orbital margin directly above the infraorbital foramen to the inferior aspect of the orbital opening of the optic canal.

Interorbital distance (ID): The difference between the biorbital distance and the sum of the right and left orbital widths.

Biorbital breadth (BB): The straight distance between the most lateral points of the orbit.

SOF–IOF: The distance between the SOF and IOF.

SOF–nasal skeletal midline (NSM): The distance between the SOF and NSM.

IOF–inferior orbital rim (IOR): The distance between the IOF and the IOR.

I**OF–piriform aperture (PA):** The distance between the IOF and PA.

IOF–maxillary skeletal midline (MSM): The distance between the IOF and MSM.

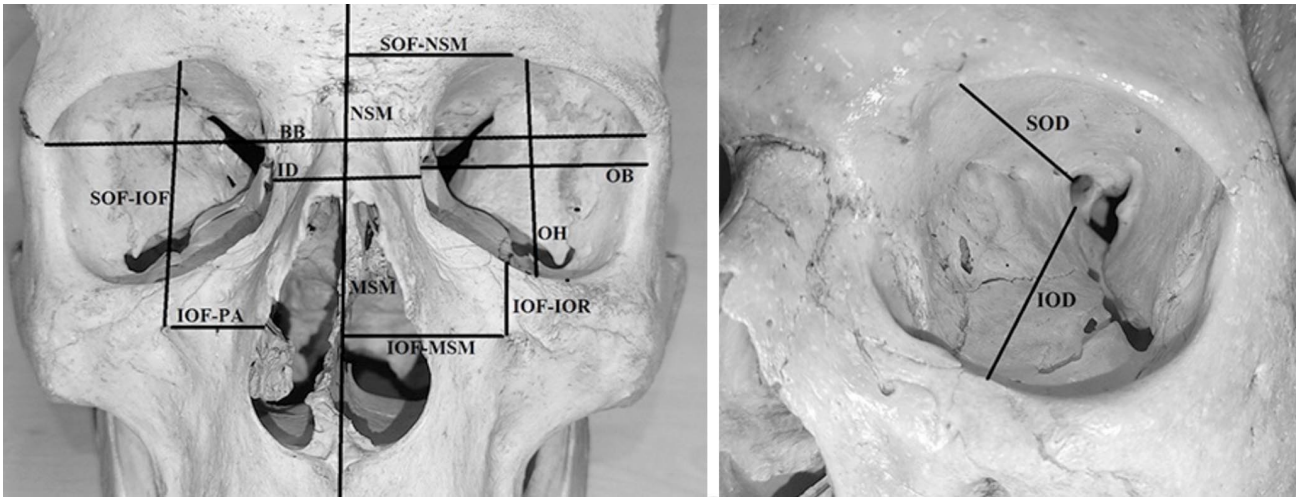

Fig. 1. SOF: Supraorbital notch/foramen, IOF: Infraorbital foramen, PA: Piriform aperture, IOR: Inferior orbital rim, NSM: Nasal skeletal midline, MSM: Maxillary skeletal midline, BB: Biorbital breadth, ID: Interorbital distance, OH: Orbital height, OB: Orbital breadth, SOD: Superior orbital depth, IOD: Inferior orbital depth.

Orbital height (OH): The distance between the midpoint of the upper and lower margins of the orbital cavity.

Orbital breadth (OB): The distance between the midpoint of the medial and lateral margin of the orbital cavity.

Orbital index (OI): (OH/OB) x 100.

Statistical analyses of the data obtained in our study were performed with SPSS v.20.0 software (IBM Corp., Armonk, NY, USA). The conformity of the data to normal distribution was determined using Shapiro–Wilk test. Descriptive analysis was performed to obtain the mean and standard deviation as well as minimum and maximum values of anthropometric measurements. Paired samples t-test was used in the right–left (bilateral) comparison of normally distributed data and in intraobservational analysis. The relationships between anthropometric measurement parameters were analyzed using the Pearson's correlation test. Statistical significance was accepted as $P \leq 0.05$.

RESULTS

The differences between the two measurements recorded by the observer were analyzed by paired samples t-test; no statistically significant difference was found ($p > 0.05$).

The mean, standard deviation, minimum, and maximum values of the measurements obtained from 41 skulls in our study are presented in Table I.

The statistical difference between the right and left sides (bilateral) in the measurements we obtained is presented in Table II. The mean right SOD value was significantly greater than the mean left SOD value ($p < 0.05$); however, no significant difference was found between the right and left sides in other parameters ($p > 0.05$).

The relationships between the measurements of the maxillofacial region of the skull are presented in Table III. Correlation values in our study ranged between -0.156 and 0.612. The highest correlation value was obtained in the positive direction between OH and SOF–IOF measurements ($r = 0.612$, $p < 0.001$).

The comparison between the measurements in our study and those (mm) in studies conducted on different populations is demonstrated in Table IV.

Table I. Mean, standard deviation (SD), minimum (min.), and maximum (max.) values of measured variables (mm)

Parameter (mm)	N	Mean	S.D.	Min	Max	SEM
SOF-IOF	41	43,735	2,66	38,01	48,51	0,415
SOF-NSM	41	23,344	3,39	16,00	29,95	0,530
IOF-IOR	41	7,306	1,55	4,41	10,72	0,243
IOF-PA	41	15,046	1,94	10,70	19,61	0,304
IOF-MSM	41	25,878	1,75	22,54	29,67	0,273
SOD	41	47,900	3,20	40,63	55,66	0,500
IOD	41	50,439	2,91	43,00	54,72	0,455
ID	41	21,853	3,29	15,57	30,05	0,513
BB	41	95,935	4,22	85,55	104,24	0,659
OH	41	34,696	2,33	29,87	38,89	0,364
OB	41	38,490	1,91	34,65	43,95	0,299
OI	41	90,223	5,64	77,93	99,60	0,881

SEM= Standart error of mean.

Table II. Descriptive statistics and bilateral differences of the right and left-sided measurements (mm) in skulls.

Parameter	Right				Left				P value
	N	Mean± S.D.	Min	Max	N	Mean± S.D.	Min	Max	
SOF-IOF	41	43,56±2,86	36,83	49,51	41	43,90±2,70	39,20	48,16	0.204
SOF-NSM	41	23,85±3,72	16,24	32,63	41	22,83±3,96	15,76	31,57	0.080
IOF-IOR	41	7,13±1,65	3,85	10,96	41	7,48±1,70	4,27	11,79	0.086
IOF-PA	41	15,14±2,24	10,62	20,55	41	14,94±1,92	10,77	19,92	0.409
IOF-MSM	41	25.89±1.76	22,52	29,72	41	25.86±1.74	22,55	29,62	0.366
SOD	41	48,13±3,19	40,66	55,65	41	47,66±3,32	40,61	55,67	0.016*
IOD	41	50,49±3,21	43,14	55,65	41	50,46±2,90	43,06	54,81	0.880
OH	41	34,67±2,24	30,18	38,50	41	34,72±2,48	29,56	39,28	0.709
OB	41	38,46±1,94	34,53	43,98	41	38,51±1,93	34,77	43,93	0.586

*= $p<0.05$

Table III. Correlation between morphometric measurements in the maxillofacial region

Parameter		OB	OH	BB	ID	IOD	SOD	IOF-MSM	IOF-PA	IOF-IOR	SOF-NSM	SOF-IOF
SOF-IOF	r	0.271	0.612**	0.407**	0.280	0.352*	0.193	0.270	0.176	0.566**	0.443**	1
	p	0.087	0.000	0.008	0.076	0.024	0.226	0.088	0.271	0.000	0.004	
SOF-NSM	r	0.143	0.159	0.320*	0.352*	0.303	0.395*	0.235	-0.092	0.272	1	
	p	0.372	0.322	0.042	0.024	0.054	0.010	0.138	0.569	0.086		
IOF-IOR	r	-0.050	-0.058	0.311*	0.448**	0.508**	0.311*	0.329*	0.159	1		
	p	0.755	0.673	0.048	0.003	0.001	0.048	0.035	0.320			
IOF-PA	r	0.231	0.156	0.358*	0.242	0.172	0.080	0.480**	1			
	p	0.146	0.329	0.022	0.127	0.283	0.619	0.002				
IOF-MSM	r	0.153	0.009	0.510**	0.165	0.483**	0.510**	1				
	p	0.339	0.954	0.001	0.304	0.002	0.001					
SOD	r	-0.047	-0.156	0.274	0.240	0.593**	1					
	p	0.772	0.329	0.084	0.131	0.000						
IOD	r	0.165	-0.056	0.440**	0.349*	1						
	p	0.303	0.728	0.004	0.025							
ID	r	0.003	0.172	0.512**	1							
	p	0.983	0.282	0.001								
BB	r	0.557**	0.400**	1								
	p	0.000	0.010									
OH	r	0.456**	1									
	p	0.003										
OB	r	1										
	p											

SEM= Standart error of mean. * Correlation is significant at the 0.05 level (2-tailed).

DISCUSSION

SOF, IOF, and morphometric measurements of the orbit as well as their localization and relationships among one another and with surrounding structures have been studied by many researchers in diverse fields such as anatomy, anthropology, neurological surgery, oral and maxillofacial surgery, plastic surgery, and dental surgery. Such studies have been performed on different populations using different samples such as dry skulls and cadavers and different methods such as radiological method.

Hwang & Baik examined orbital measurements in the skull of 41 adults of Korean population and obtained mean SOD, IOD, OH, and OB values of 44.9 ± 2 mm, 45.5 ± 2.5 mm, 35 ± 1.8 mm, and 35 ± 1.8 mm, respectively. In a study conducted on skulls belonging to the Indian population, OH values on the right and left were observed to be 35.5 ± 2.3 mm and 35.3 ± 2.4 mm, respectively, whereas the respective OB values on the right and left were 41.8 ± 2.8 mm and 41.7 ± 2.8 mm (Mekala *et al*., 2015). In a study conducted by Ukoha *et al*. (2011) on the skulls of adult Nigerian men, OH, and OB measurements were found to be 31.9 mm and 36.03 mm on the right and 31.45 mm and 34.98 mm on the left, respectively. Munguti *et al*. determined the mean values of SOD and IOD measurements as 52.9 ± 2.86 mm and 54.7 ± 2.88 mm on the right and 53.1 ± 2.60 mm and 54.8 ± 2.74 mm on the left, respectively, in a similar study on Kenyan population, another African community. In addition to these measurements, they reported that mean ID and BB measurements were found to be 18.26 ± 3.32 mm and 96.43 ± 4.86 mm in women and 18.91 ± 3.18 mm and 99.49 ± 4.31 mm in men, respectively (Munguti *et al*.). In our study, the mean values of SOD, IOD, OH, and OB measurements were determined as 48.13 ± 3.19 mm, 50.49 ± 3.21 mm, 34.67 ± 2.24 mm, and 38.46 ± 1.94 mm on the right and 47.66 ± 3.32 mm, 50.46 ± 2.90 mm, 34.72 ± 2.48 mm, and 38.51 ± 1.93 mm on the left, respectively. The mean values of ID and BB measurements were obtained as 21.85 ± 3.29 mm and 95.93 ± 4.22 mm, respectively. It was found that SOD and IOD measurements were lower than those of Kenyans, but higher than those of Koreans in our study. When we examined OH measurements, it was found that the mean values were higher than those of Africans (Nigerians) when they were close to Asians (Korean, Indian); and OB measurements were higher than those of Nigerians and Koreans, and lower than those of Indians. In addition to, when we examined the mean values of ID measurement

Table IV. Comparison between maxillofacial region measurements (mm) obtained in our study and those in studies conducted on different populations.

Researchers	N	Population / Region	SOD		IOD		OH		OB		ID	BB	IOF-IOR		IOF-PA		IOF- MSM		SOF- NSM		SOF-IOF
			Right	Left	Right	Left	Right	Left	Right	Left			Right	Left	Right	Left	Right	Left	Right	Left	Right
Chrcanovic *et al.* (2011)	80	Brazilian	-	-	-	-	-	-	-	-	-	-	6.30±1.67	6.52±1.72	14.65±2.10	14.79±1.96	24.86±2.75	25.66±2.39	26.43±3.77	27.52±4.71	42.71±3.02
Hwang & Baik (1999)	41	Korean	44.9±2		45.5±2.5		35±1.8		35±1.8		-	-	-	-	-	-	-	-	-	-	-
Agthong *et al.* (2005)	110	Asian	-	-	-	-	-	-	-	-	-	-	7.8±0.2	8±0.2	-	-	-	-	24.4±0.3	25.1±0.4	-
Apinhasmit *et al.* (2006)	106	Thai	-	-	-	-	-	-	-	-	-	-	9.23±2.03		-	-	28.43±2.29		25.14±4.29		44.95±2.96
Gupta (2008)	79	Indian	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28±2.8	28.7±2.5	23.7±3	24.1±3.4	40.9±4.1
Panicker *et al.* (2016)	60	Indian	-	-	-	-	-	-	-	-	-	-	5.96±1.59	6.07±1.73	16.70	16.63	-	-	-	-	-
Aziz *et al.* (2000)	47	American	-	-	-	-	-	-	-	-	-	-	8.3±1.9	8.1± 1.9	-	-	-	-	-	-	-
Gibelli *et al.* (2019)	100	Caucasoid individuals	-	-	-	-	-	-	-	-	-	-	6.6±1.7	6.7± 1.6	-	-	-	-	-	-	-
Bah_i *et al.* (2019)	150	Anatolian	-	-	-	-	-	-	-	-	-	-	7.47±1.40	7.39±1.41	-	-	23.52±2.26	23.43±2.39	-	-	-
Liu *et al.* (2014)	30	Chinese	-	-	-	-	-	-	-	-	-	-	9.6±1.3		-	-	32.7±3.4		-	-	-
Raschke *et al.* (2013)	44	American	-	-	-	-	-	-	-	-	-	-	8.25±0.54 (f) 8.61±0.64 (m)		15.69±0.76 (f) 17.43±1.19 (m)		-	-	-	-	-
Munguti *et al.* (2012)	113	Kenyan	52.9±2.86	53.1±2.60	54.7±2.88	54.8±2.74	-	-	-	-	18.26±3.32 (f) 18.91±3.18 (m)	96.43±4.86 (f) 99.49±4.31 (m)	-	-	-	-	-	-	-	-	-
Ibrahim *et al.* (2018)	34	Malay	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25.45	25.73	-
	33	Indian	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26.89	25.49	-
	33	Chinese	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26.08	25.82	-
Mekala *et al.* (2015)	200	Indian	-	-	-	-	35.5±2.3	35.3±2.4	41.8±2.8	41.7±2.8	-	-	-	-	-	-	-	-	-	-	-
Ukoha *et al.* (2011)	70	Nigerian	-	-	-	-	31.9 (m)	31.45 (m)	36.03 (m)	34.98 (m)	-	-	-	-	-	-	-	-	-	-	-
Chung *et al.* (1995)	124	Korean	-	-	-	-	-	-	-	-	-	-	7.8 (f) 9 (m)		-	-	27.2		22.7		45.6
Singh R. (2011)	55	Indian	-	-	-	-	-	-	-	-	-	-	6.12±1.79	6.19±1.81	15.31±1.77	15.80±2.86	-	-	-	-	-
Macedo *et al.* (2009)	295	Brazilian	-	-	-	-	-	-	-	-	-	-	6.28±1.79	6.45±1.76	17.7±2.10	17.6±2.04	-	-	-	-	-
Ercikti *et al.* (2017)	20	Turkey	-	-	-	-	-	-	-	-	-	-	8.8 ±1.0		-	-	30.3 ± 2.7		-	-	-
Aggarwal *et al.* (2015)	67	Indian	-	-	-	-	-	-	-	-	-	-	6.37±1.52	6.28±1.25	15.51±1.63	14.87±1.73	25.63±2.27	25.74±2.50	-	-	-
Rahman *et al.* (2009)	11	American	-	-	-	-	-	-	-	-	-	-	8		17		26		-	-	-
Present study	41	Anatolian	48,13±3,19	47,66±3,32	50,49±3,21	50,46±2,90	34,67±2,24	34,72±2,48	38,46±1,94	38,51±1,93	21,85±3,29	95,93±4,22	7,13±1,65	7,48±1,70	15,14±2,24	14,94±1,92	25.89±1.76	25.86±1.74	23,85±3,72	22,83±3,96	43,56±2,86

f= female, m= male, -: none

data, it was found that our measurements were higher than those of Kenyan population and lower in BB measurements.

IOF–IOR has been studied by many researchers on different populations. On examining such studies conducted on Asian populations, IOF–IOR measurement values in the Indian population were observed to be between 5.96 mm and 6.37 mm on the right and between 6.07 mm and 6.28 mm on the left side (Singh, 2011; Aggarwal *et al*., 2015; Panicker *et al*.). In populations of Southeast and East Asia (Thailand, Chinese, South Korea), these values were found to be between 7.8 mm and 9.6 mm (Chung *et al*., 1995; Agthong *et al*.; Apinhasmit *et al*.; Liu *et al*., 2014). Further, in studies conducted in the Brazilian population, it was observed that the IOF–IOR values were between 6.28 mm and 6.52 mm (Macedo *et al*., 2009; Chrcanovic *et al*.). In the study conducted by Gibelli *et al*. (2019) on Caucasoid individuals in Italy, this measurement was found to be 6.6 ± 1.7 mm on the right, and 6.7 ± 1.6 mm on the left, whereas in studies conducted on the American population, it was observed that the IOF–IOR measurement values were between 8 mm and 8.61 mm (Aziz *et al*.; Rahman *et al*., 2009; Raschke *et al*., 2013). In the studies conducted in Turkey, researchers found these values to be between 7:39 and 8.8 mm (Ercikti *et al*., 2017; Bahs¸i *et al*., 2019). In our study, the IOF–IOR measurement values were found to be 7.13 ± 1.65 mm, 7.48 ± 1.70 mm on the right and on the left side, respectively.

In previous studies the IOF-PA measurements values were varied between 14.65 mm and 17.7 mm in studies conducted in the Brazilian population, 14.87 mm - 16.63 mm in the Indian population,

and 15.69 mm - 17.43 mm in the American population (Macedo *et al*.; Rahman *et al*.; Chrcanovic *et al*.; Singh; Raschke *et al*.; Aggarwal *et al*.; Panicker *et al*.). In our study, IOF-PA measurement values were found to be 15.14 ± 2.24 mm on the right and 14.94 ± 1.92 mm on the left. We suggest that to find the exact location of the IOF, it is necessary to define standard landmarks that could be found more easily and more practical by exam palpation.

Rahman *et al*. measured the IOF–MSM value in their study in the American population and obtained a mean value of 26 mm, whereas in studies conducted in the Indian population, this value ranged between 25.63 mm and 28.7 mm (Gupta, 2008; Rahman *et al*.; Aggarwal *et al*.). In their study on the Brazilian population, Chrcanovic *et al*. found this measurement value to range between 24.86 ± 2.75 mm and 25.66 ± 2.39 mm. In studies conducted on Southeast and East Asian populations, it was observed that the mean values of IOF–MSM were between 27.2 mm and 32.7 mm, whereas its mean value was observed between 23.43 mm to 30.3 mm in studies conducted in Turkey (Chung *et al*.; Apinhasmit *et al*.; Liu *et al*.; Ercikti *et al*.; Bahs¸i *et al*.). In our study, the mean IOF–MSM values were 25.89 ± 1.76 mm on the right and 25.86 ± 1.74 mm on the left.

In a study conducted by Chrcanovic *et al*. on Brazilian population, the mean SOF–IOF values were found to be 42.71 ± 3.02 mm on the right and 43.12 ± 3.21 mm on the left, whereas In a study conducted by Gupta on the Indian population, the mean SOF–IOF values were 40.9 ± 4.1 mm on the right and 42.4 ± 3.2 mm on the left. In the study conducted by Apinhasmit *et al*. on Thai population, it was observed that mean SOF–IOF value was 44.95 ± 2.96 mm. Chung *et al*. found this value to be 45.6 mm in their study on the skulls of Korean populations. In our study, the mean values of SOF–IOF measurement were found to be 43.56 ± 2.86 mm on the right and 43.90 ± 2.70 mm on the left. It was found that the SOF-IOF measurement obtained in our study was close to that of Brazilians, lower than those of Thai and Korean, and higher than Indians.

The mean values of SOF–NSM in studies conducted in Asian societies (Indian, Thailand, Chinese, South Korea, and Malay) were between 22.7 mm and 26.89 mm (Chung *et al*.; Agthong *et al*.; Apinhasmit *et al*.; Gupta; Ibrahim *et al*., 2018). In the study conducted by Chrcanovic *et al*. on the skulls of the Brazilian population, they found the mean value of SOF–NSM measurement to be 26.43 ± 3.77 mm on the right and 27.52 ± 4.71 mm on the left. In our study, the mean values of this measurement were obtained as 23.85 ± 3.72 mm on the right and 22.83 ± 3.96 mm on the left. It was observed that the mean SOF-NSM value obtained in our study was similar to that of Koreans, and was lower when compared to that of Brazilians and other Asian populations.

We believe that the measurements of the orbit, SOF, and IOF along with the data we obtained in our study on their localizations and relationships will serve as a guide and allow surgeons to perform surgical interventions and local anesthesia procedures in the frontal, periorbital, and maxillofacial regions without damaging the neurovascular bundles in these regions, thereby reducing the risk of paralysis and paresthesia. In addition, we believe that population-specific data pools should be created, and these measurements and their localization in the maxillofacial region should be classified according to parameters such as age, sex, and position (right/left side).

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RESUMEN: El objetivo de este estudio fue examinar la localización de los hitos en la región maxilofacial y sus relaciones entre sí y evaluarlos morfológica y clínicamente. Nuestro estudio incluyó 41 cráneos humanos adultos secos de edad y sexo desconocidos de la población de Anatolia. El análisis estadístico de los datos obtenidos en nuestro estudio se realizó con el software SPSS v.20.0 (IBM Corp., Armonk, NY, EE. UU.). La significación estadística se aceptó como P ≤ 0,05. Mientras que el valor medio de la profundidad supraorbitaria derecha (SOD) fue significativamente mayor que el valor medio de la SOD izquierda (p <0,05), no se encontraron diferencias significativas entre los lados derecho e izquierdo en todas las demás mediciones (p> 0,05). Los valores de correlación en nuestro estudio variaron entre -0,156 y 0,612. El mayor valor de correlación se obtuvo en la dirección positiva entre las medidas de altura orbitaria (OH) y foramen supraorbitario-foramen infraorbitario (SOF-IOF) (r = 0,612, p <0,001). Creemos que las mediciones de la órbita, SOF e IOF y nuestros datos sobre sus localizaciones, junto con las relaciones que observamos en nuestro estudio, permitirán a los cirujanos evitar dañar los haces neurovasculares durante las intervenciones quirúrgicas y los procedimientos de anestesia local en la zona frontal, periorbitaria. y regiones maxilofaciales.

PALABRAS CLAVE: Incisura; Foramen supraorbitario; Foramen infraorbitario; Medidas morfométricas; Cirugía Maxilofacial.

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