The anatomy of the nose has a tremendous effect on rhinoplasty outcomes. Several bones are involved in the anatomy of the nose, including the frontal, ethmoid, maxilla, and nasal bones. In reviewing the published studies, the nasal bones form approximately one-third of the nasal vault. Failure to detect short nasal bones can lead to significant post-rhinoplasty complications. To the best of our knowledge, no published descriptions of the Middle Eastern skeletal anatomy of the nose are available. The aims of this study were to determine the mean length of nasal bones, amount of nasal dorsum it forms in relation to the whole nose, and incidence of short nasal bones in the Middle Eastern population.

**Background and Objectives:** Hump reduction in the presence of short nasal bones can result in significant esthetic and/or functional problems in patients seeking rhinoplasty in the Middle East. The aims of this study were to determine the mean length of nasal bones, amount of nasal dorsum it forms in relation to the whole nose, and incidence of short nasal bones in the Middle Eastern population.

**Design and Settings:** A prospective study that has been carried out in a tertiary care hospital.

**Patients and Methods:** A total of 154 patients (80 females and 74 males) who were scheduled for computed tomography scan for the paranasal sinuses were included in the study. The inclusion criteria were adults with no history of facial/nasal trauma, sinus space occupying lesions, or surgery.

**Results:** In male subjects, the mean clinical nasal bone length was 19.6 (2.90) mm (12.0–24.8) and the median was 19.0, and the mean radiological nasal bone length was 24.96 mm. In females, the mean clinical nasal bone length was 18.17 mm and the mean radiological bone length was 22.82 mm.

**Conclusion:** The bony vault represents 44.2% of the female nose and 44.3% of the male nose. In the present study, no patients displayed a short nasal bone that was less than one-third of the whole nasal length.

**Patients and Methods**

A total of 154 patients (80 females and 74 males) who were scheduled for CT scans for the paranasal sinuses were included in the study. Patients who fulfilled the inclusion criteria were randomly selected for participation in the study. The inclusion criteria were adults with no history of facial/nasal trauma and sinus space occupying lesions or surgery. Only patients of the clear Middle East background were included, with exclusion of other races. The clinical and radiological nasal bone length and the total nasal length were measured, and the proportion of the nasal bone length to the whole nose length was calculated. The clinical nasal bone length was measured from the radix to the keystone area (K area) at the rhinion in the midline, and the total clinical nasal length was measured from the radix to the nasal tip. The radiological measurements were conducted from the nasofrontal suture line to the K area and to the tip at the midline (Figures 1 and 2).

**Results**

In male subjects, the mean clinical nasal bone length was 19.6 (2.90) mm (12.0–24.8) and the median was 19.0, and the mean radiological nasal bone length was
25.0 (3.1) mm (17.2–30.0) and the median was 25.5. In female subjects, the mean clinical and radiological nasal bone lengths were 18.2 (3.4) mm (11.5–25.0) with the median 18.0 and 22.9 (3.0) mm (17.3–28.0) with the median 23.1, respectively. The clinical and radiological nasal lengths in males were 49.8 (3.2) mm (44.0–56.0) with the median 49.1 and 56.3 (3.5) mm (51.3–64.0) with the median 55.3, respectively. The clinical and radiological proportions of the nasal bone length to the whole nose length were 39.4% and 44.3% in males and 39.4% and 44.2% in females, respectively.

**DISCUSSION**

The correction of a high and/or wide nasal dorsum is one of the most common maneuvers in the Middle Eastern rhinoplasty. To address the nasal imbalance, an aggressive but nondestructive surgical approach often requires a significant cartilaginous excision and bony hump reduction with a chisel or rasp. The majority of procedures that alter the middle vault focus on reducing the dorsal hump, correcting internal nasal valve collapse, or correcting a twisted nose with spreader grafts. Because of the involvement of nasal support structures, such as the upper lateral cartilage and the keystone and scroll areas, these procedures have both esthetic and functional impacts. Surgical techniques in this region include spreader grafts, spreader flaps, split hump reduction technique, and cartilage grafts from the rib and ear. These techniques correct deformities and prevent complications such as inverted V, hourglass and saddle nose deformities, and nasal valve narrowing. Therefore, avoiding over-resection is crucial.

Using horizontal shaving of the upper lateral cartilage to reduce the dorsal height of the middle nasal vault can also compromise function by narrowing the nasal valve. Patients with a broad middle vault without internal nasal valve collapse may benefit from reductions of the horizontal width of the cartilaginous dorsum, which is the reverse of spreader grafts.

Compared with rhinoplasties on non-Middle Eastern patients, the esthetic alteration of a Middle Eastern nose may follow different techniques. After the dorsal hump is reduced, short spreader grafts effectively restore and/or maintain the internal nasal valve area. Thomas and Pendiville and Toriumi and Ries have described a selective tangential shaving of the convex side of the dorsal septum to assist in correcting the C-shaped deformity. For setting a wide middle vault, the reverse spreader technique is a useful alternative to dorsal augmentation, which creates the illusion of a narrower dorsum; however, patients with a wide, low dorsum may benefit more from dorsal augmentation than from the reverse spreader technique. Caution should be taken in patients who have...
internal nasal valve compromise, as the problem can be exacerbated by the reverse spreader technique. Nasal bone length is commonly referenced in the published studies related to rhinoplasty. It has been suggested that short nasal bones may predispose to a greater risk of middle vault collapse and inverted V deformity after rhinoplasty. However, limited data are available on what constitutes the normal measurements of these structures of the nose. In addition to this and to the best of our knowledge, no data exist on the gender and ethnic variability of such measurements.

The result of our study shows a difference between the clinical and radiological measurements of the nasal bone length. No evidence is available in the published studies about how long the nasal bone should be, but short nasal bones can contribute to the formation of post-rhinoplasty deformities (e.g., inverted V deformity). In our study, the nasal bone length differed between genders: the male group displayed a longer nasal bone both clinically and radiologically. The result shows similar proportions of the bony vault: the bony vault represents 44.2% of the female nose and 44.3% of the male nose. In the present study, no patients displayed a short nasal bone that was less than one-third of the whole nasal length.

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