The performance of cosmetic procedures has increased markedly in the past decade. According to the American Society for Aesthetic Plastic Surgery, almost 11 million surgical and nonsurgical cosmetic procedures were performed in the United States in 2013.¹ There are three factors that are likely to play a role in the recent upsurge of cosmetic surgery. These factors include medical advancements, patient characteristics, and media influences.² Rhinoplasty is one of the most commonly performed cosmetic procedures around the world. Iran has the highest rate of cosmetic rhinoplasty in the world.² Although there are no precise statistics on cosmetic surgery in Saudi Arabia (because of a lack of registration), the increasing number of rhinoplasties performed in several institutes and the number of people applying for this procedure suggests that the overall number has increased, particularly among females. Previously, rhinoplasty was confined to repairing damage, but in modern times it has been used to change the shape of the nose for aesthetic purposes. Its effect on the quality of life of the patient has been studied extensively, as this is considered an important long-term outcome. The definition of the ideal nose differs among the races and aesthetic modification of the nose follows different principles for various ethnic patients. Middle Eastern patients frequently prefer specific ethnic traits, such as a higher dorsum and less obtuse nasolabial and columellar labial angles than their

***Common nasal deformities among rhinoplasty patients in a university hospital in Saudi Arabia***

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**BACKGROUND:** Rhinoplasty has become one of the most common aesthetic procedures in the world. Few studies from the Middle East have described rhinoplasty patients in the region.

**OBJECTIVE:** To investigate common nasal deformities in individuals seeking rhinoplasty at a single institution in Saudi Arabia.

**DESIGN:** Retrospective study and chart review.

**SETTING:** King Abdulaziz University Hospital, Riyadh, Saudi Arabia.

**PATIENTS AND METHODS:** All patients seeking primary rhinoplasty who were 15 years of age and older were included. The types of external nasal deformities were compared by gender and age groups.

**MAIN OUTCOME MEASURE:** Types of external nasal deformities.

**RESULTS:** Of the 248 patients investigated, 113 were male and 135 female. The most common external nasal deformity was a broad dorsum (n=163; 65.7%), followed by a bulbous columella (n=154; 62.1%), and deviation (n=150; 60.5%). Upward columella was most common in older patients, and deviation decreased with age.

**CONCLUSION:** The most common deformity among the study population of Saudis was a wide nasal dorsum, bulbous nasal tip and deviated nose. Studying nasal deformity in some ethnic groups has an influence in selecting and practicing specific rhinoplasty approaches.

**LIMITATIONS:** Study conducted in one hospital and may not be generalizable.
counterparts of European ancestry. Multiple esthetic nasal abnormalities have been seen in patients seeking rhinoplasty. Yu and colleagues have reported that the most common aesthetic abnormality in multiply revised noses is tip irregularity/asymmetry, a crooked middle-third of the nose, and an upper-third irregularity. A dorsal hump is almost invariably the primary reason for seeking rhinoplasty. The typical Middle Eastern nose has been characterized as having a thick skin, dorsal hump, over-projected radix, wide upper two-thirds, nasal deviation, poorly defined and under-projected tip, weak lower lateral cartilages, acute nasolabial angle, and nostril tip asymmetries with varying ratios. Moreover, the Middle Eastern nose has been reported by many surgeons to be the most difficult nasal type for rhinoplasty procedures, because of certain characteristics. Daniel reviewed the literature, and concluded that the Middle Eastern nose has the following characteristics: 1) heavy, thick skin envelope; (2) over-projecting osseocartilaginous vault, including the radix; (3) weak alar cartilages with limited support; and (4) short middle and medial crus.

This article illustrates the common nasal features of Saudi patients who underwent rhinoplasty and reviews crucial concepts of rhinoplasty in such patients.

PATIENTS AND METHODS

The Institutional Review Board of the College of Medicine, King Saud University approved this study. Consent was taken from all patients either written or verbally for use of the images, and their data were extracted from their medical records. This was a retrospective chart review, designed to determine the common types of external nasal deformities in patients seeking rhinoplasty at a single institution in Saudi Arabia. We included 248 patients with available data from 2010–2015. Exclusion criteria were age less than 15 years and previous nasal surgeries.

Nasal deformity types were compared between males and females and between different age groups using the chi-square or Fisher exact test, as appropriate, and odds ratios with 95% confidence intervals were calculated to assess the strength of associations. Analyses were conducted ISM SPSS software, version 21 (IBM SPSS, Inc. ARMONK NY USA). All tests were two-sided and P values <.05 were considered statistically significant.

RESULTS

The 248 Saudi patients included in the study had several different external nasal deformities. The most common deformity was a broad nasal dorsum (n=163, 65.7%) (Figure 1), followed by a bulbous nasal tip (n=154, 62.1%) (Figure 2), and deviation of the nose (n=150, 60.5%) (Figure 3). Deviation was more frequent in the 20-24 year age group patients, which included 44.0% of cases. An under-rotated nasal tip was most common in the 20−24 years age group (P=.047). Increased columellar show was more common in the oldest age group (P=.04) (Table 1). Deviation was more common in males than in females (69% versus 53.3%, P=.012) with the odds of deviation almost twice as great in males as in females (OR=1.95). Males were also significantly more likely to have under projection of the nasal tip (OR=3.6, P=.004) and asymmetric tip definition (OR=2.65, P=.009), Table 2.

Figure 1. Dorsal nasal hump.

Figure 2. Broad nasal dorsum and bulbous nasal tip.
COMMON NASAL DEFORMITIES

DISCUSSION

Rhinoplasty is one of the most commonly performed cosmetic procedures around the world. In the current study, among Saudi patients seeking rhinoplasty, the most common nasal deformity was a broad dorsum followed by a bulbous nasal tip, and deviated nose. These findings are in agreement with the published literature on the Middle Eastern nose. Moreover, a study performed in the Iranian population by Pourdanesh and colleagues reported relatively similar findings, with the most common nasal deformities being a droopy nasal tip (88.8%), followed by a hump nose (82.4%), large nasal tip (75.5%), and wide alar area (35.12%). Management of these various deformities has been addressed in various publications. In such cases conventional rhinoplasty techniques may lead to suboptimal results ending with dissatisfied surgeons and patients. A combination of different surgical maneuvers is often needed to address the Middle Eastern nose and to produce the target aesthetic results. Seeking rhinoplasty is more popular among young than older patients. In our study, the mean age of patients who underwent rhinoplasty was 23 years, which supports the findings of another study that investigated the attitude of college students toward cosmetic surgery in which a similar age range (20.2 [2.1] years) was reported. Surprisingly, we found that the trend toward rhinoplasty was very high in males in contrast to our expectations.

Table 1. External nasal deformity by age group.

| Deformity          | 15-19 years | 20-24 years | 25-29 years | 30+ years | %     | P value |
|--------------------|-------------|-------------|-------------|-----------|-------|---------|
| Deviation          | 36 (24.0%)  | 66 (44.0%)  | 24 (16.0%)  | 24 (16.0%)| 60.5  | .001    |
| Dorsal hump        | 25 (21.7%)  | 47 (40.9%)  | 25 (21.7%)  | 18 (15.7%)| 46.4  | .242    |
| Tension nose       | 3 (33.3%)   | 3 (33.3%)   | 2 (22.2%)   | 1 (11.1%) | 3.6   | .672    |
| Broad dorsum       | 31 (19.0%)  | 68 (41.7%)  | 31 (19.0%)  | 33 (20.2%)| 65.7  | .396    |
| Saddle nose        | 3 (20.0%)   | 4 (26.7%)   | 4 (26.7%)   | 4 (26.7%) | 6.0   | .772    |
| Nasal tip rotation:|             |             |             |           |       |         |
| Decreased          | 12 (22.2%)  | 17 (31.5%)  | 15 (27.8%)  | 10 (18.5%)| 21.8  | .411    |
| Increased          | 0 (0.0%)    | 2 (40.0%)   | 0 (0.0%)    | 3 (60.0%) | 2.0   | .183    |
| Nasal tip projection:|         |             |             |           |       |         |
| Decreased          | 6 (15.8%)   | 21 (55.3%)  | 8 (21.1%)   | 3 (7.9%)  | 15.3  | .047    |
| Increased          | 0 (0.0%)    | 1 (25.0%)   | 2 (50.0%)   | 1 (25.0%) | 1.6   | .474    |
| Tip definition:    |             |             |             |           |       |         |
| Bulbous            | 26 (16.9%)  | 60 (39.0%)  | 32 (20.8%)  | 36 (23.4%)| 62.1  | .383    |
| Asymmetric         | 6 (17.1%)   | 13 (37.1%)  | 8 (22.9%)   | 8 (22.9%) | 14.1  | .954    |
| Boxy (square)      | 7 (22.6%)   | 10 (32.3%)  | 8 (25.8%)   | 6 (19.4%) | 12.5  | .815    |
| Columellar show:   |             |             |             |           |       |         |
| Decreased          | 2 (33.3%)   | 2 (33.3%)   | 1 (16.7%)   | 1 (16.7%) | 2.4   | .88     |
| Increased          | 4 (26.7%)   | 2 (13.3%)   | 2 (13.3%)   | 7 (46.7%) | 6.0   | .04     |

Figure 3. Deviation of the external nose.
Table 2. External nasal deformities by gender.

| Deformity          | Female N=135 | Male N=113 | Ratio (male:female) | Odds ratio 95% CI | P value |
|--------------------|--------------|------------|---------------------|-------------------|---------|
| Deviation          | 72 (53.3)    | 78 (69.0)  | 13:12               | 1.95 (1.16-3.29)  | .012    |
| Dorsal hump        | 60 (44.4)    | 55 (48.7)  | 11:12               | 1.19 (0.72-1.96)  | .506    |
| Tension nose       | 4 (3.0)      | 5 (4.4)    | 5:04                | 1.52 (0.40-5.79)  | .736    |
| Broad dorsum       | 85 (63.0)    | 78 (69.0)  | 78:85               | 1.31 (0.77-2.23)  | .316    |
| Saddle nose        | 11 (8.1)     | 4 (3.5)    | 4:11                | 0.41 (0.13-1.34)  | .182    |
| **Nasal tip rotation:** |              |            |                     |                   |         |
| Decreased          | 29 (21.5)    | 25 (22.1)  | 25:29:00            | 1.04 (0.57-1.90)  | .903    |
| Increased          | 3 (2.2)      | 2 (1.8)    | 2.03                | 0.79 (0.13-4.83)  | .801    |
| **Nasal tip projection:** |           |            |                     |                   |         |
| Decreased          | 12 (9.1)     | 26 (23.0)  | 13:06               | 3.6 (1.47-6.40)   | .004    |
| Increased          | 1 (0.7)      | 3 (2.7)    | 3:01                |                   | .265    |
| **Tip definition:** |              |            |                     |                   |         |
| Bulbous            | 87 (64.4)    | 67 (59.3)  | 67:87               | 0.80 (0.48-1.34)  | .432    |
| Asymmetric         | 12 (8.9)     | 23 (20.4)  | 23:12               | 2.65 (1.25-5.60)  | .009    |
| Boxy (square)      | 19 (14.1)    | 12 (10.6)  | 1:19                | 0.72 (0.34-1.57)  | .413    |
| **Columella show:** |              |            |                     |                   |         |
| Decreased          | 3 (2.2)      | 3 (2.7)    | 1:01                | 1.20 (0.24-6.06)  | .825    |
| Increased          | 9 (6.7)      | 6 (5.3)    | 2:03                | 0.79 (0.27-2.28)  | .656    |

However, Pourdanesh et al reported similar finding among Iranians, where 40% of the population seeking rhinoplasty were males.¹

We found deviation of the nose to be more common in younger patients. This could be attributed to the risky behavior of teenagers and their involvement in fights and accidents, which might cause nasal trauma, and their natural concern about their aesthetic features. Nasal septum deviation was more common in males than in females, which could be attributed to the higher rate of road traffic accidents and trauma among males than females.

Rhinoplasty is a challenging procedure that does not use a standard surgical approach, as many different approaches are performed according to the specific deformities. For instance, tip deformity, which is one of the most common challenges in Middle Eastern patients, is usually corrected by a tip graft followed by tip suturing.¹ Other deformities, such as a wide nasal dorsum and dorsal hump, which were common among our patients, are usually managed by graduated dorsal reduction to align the nasal dorsum by preserving the integrity of the upper lateral cartilage followed by multiple different osteotomies.¹ Therefore, practicing surgeons in Saudi Arabia should understand and master different correcting techniques for most common nasal deformities, which will eventually improve patient satisfaction postsurgery.

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Conflict of interest
The authors have no conflicts of interest to declare.
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