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## **INTRODUCTION**

From the 1940's to the 1960's, most patients seeking cosmetic surgery were referred for psychiatric evaluation, as it was felt that essentially every patient seeking cosmetic surgery had a psychiatric problem. Psychiatric illness was considered an absolute contraindication to cosmetic surgery. By the 1990's Stanbaugh and others asserted that "there [were] no poor candidates for facial aesthetic surgery." The 2000's have been marked by a heightened cultural awareness and acceptance of cosmetic surgery for both females and males. Television programs such as "Extreme Makeover" reflect an unprecedented celebration of aesthetic surgery. It is not surprising that the current level of demand for cosmetic surgery is greater than ever before.

As the demand for aesthetic surgery continues to grow, a reliable means of assessing the patient is desired. This paper will discuss the preoperative evaluation of the surgical patient, including patient selection and facial analysis.

## **THE SURGEON'S ROLE /PATIENT SELECTION**

The surgeon plays the roles of physician, therapist, psychiatrist and artist. Successful cosmetic surgeons tend to have three characteristics. First, they recognize their role is no longer sacrosanct yet they are able to maintain the principle role of leader. Second, they approach problems affirmatively and assertively. Third, and most importantly, they have a clear understanding of the patient's motivation before the operation proceeds.

First and foremost the surgeon must understand the motivation of the patient. This is not always easy, as patients may mask their true desires. They may even request one surgery, when truly desiring another. Occasionally, the patient suffers from a psychiatric illness. Such circumstances demand the surgeon understand what is *not* said. This means the surgeon know the patient, including a complete history and physical exam with emphasis on social and family history.

The selection of a patient for cosmetic surgery begins with the initial interview. It is the surgeon's responsibility to screen all patients. A poor outcome is likely due to either poor patient selection or technical error. Once the patient's medical history and physical exam indicate that the patient is able to undergo surgery, the physician should attempt to uncover the patient's fears and wishes and to assess whether these issues will lead to future problems. Rohrich felt that a surgeon must understand the patient's personality traits, likes and dislikes, as well as their goals for surgery, their reason for pursuing surgery at that time, and their expectations for surgical outcomes. If the surgeon does not feel comfortable with the information obtained from the patient he or she should either continue with more in-depth evaluation of the patient, or refer the patient to someone else. Goldwyn and Gorney (see below) proposed additional series of questions that might be used to preoperatively evaluate the aesthetic patient. The accepted consensus emphasizes that the surgeon spend whatever time is necessary to effectively evaluate the patient such that he or she is able to offer the best treatment option for each patient. When couched in the context of the surgeon's aesthetic standards and surgical abilities the offered treatment options may range from referral to surgical correction, but should be based on a thorough understanding of the patient and their desires.

The patient interview requires a subtle leadership which relies on communication. The physician should not voice any opinion until the patient has fully explained their desires. This avoids projection of the surgeon's wishes onto the patient. The surgeon should explain what can and cannot be accomplished with all interventions. The most frequently expressed patient dissatisfaction is the physician's lack of communication prior to treatment. Thus, the definition of an acceptable outcome should be jointly established by the surgeon and the patient *prior to any surgical procedure*. Failure to do so may result in misunderstandings and dissatisfied parties.

## **PSYCHOLOGIC CONDITIONS**

Early studies on patients seeking cosmetic surgery showed a large percentage of patients with identifiable psychological problems. These studies employed an interview format of psychoanalysis, and suffered from the lack of standardization and bias. More recent standardized studies employing survey formats have identified a much smaller percentage of psychopathology in cosmetic patients. Moreover, studies have shown that many patients suffering from depression, neurosis, and even psychosis report a significant improvement of their symptoms after cosmetic surgery. There are, however, a group of patients who have consistently been shown to fair poorly after cosmetic surgery. The aesthetic surgeon should be able to recognize psychological conditions and then use that knowledge to make informed patient recommendations in regards to surgery and/or psychiatric evaluation. If the patient is already under psychiatric care, the decision to pursue surgery should include the psychiatrist, as well.

*The neurotic patient:* The neurotic patient is characterized by excessive worry, anxiety and somatic complaints. These neuroses serve as a defense mechanism, and attempting to address these characteristics in a flippant manner results in a defensive, unhappy patient. These patients usually ask numerous, often repetitive, questions which often require detailed and technical explanations. They often obsess about possible postoperative complications, which they usually are aware of in detail. Their questions are often a "cover" for the need for

reassurance.

Properly counseled, neurotic patients often make excellent surgical candidates. Their preoperative concerns are usually unfounded, and they are often happy with results. The important part in this patient selection is to identify the problem preoperatively and properly address all issues, including possible psychological evaluation.

*The psychotic patient:* The most commonly seen psychotic disorder is schizophrenia. These patients have disorganized thoughts, flight of ideas and are incapable of introspection. They are usually emotionless and humorless. The paranoid schizophrenic also incorporates thoughts of persecution and selfish behavior. Several cases of paranoid schizophrenics turning violent after their cosmetic surgeon attempted to terminate care have been reported. Thus, if a patient appears paranoid, a psychiatric evaluation should be pursued. If one chooses to operate on the paranoid patient, meticulous postoperative care should be anticipated.

*Personality Disorders:* Personality disorders manifest as behavior problems, rather than psychotic or neurotic problems. Unfortunately, these patients are often able to disguise their personalities, making diagnoses difficult.

The narcissistic patient is usually regal and elegant in appearance, and often obsessed with subtle- even imperceptible - physical flaws. Their opinions of themselves are often grandiose, and they are sometimes "name droppers." They suffer from poor ego formation and self esteem, and are prone to postoperative depression and dissatisfaction. Psychiatric evaluation is warranted.

Several other personality disorders have "splitting" as a personality trait. "Splitting" refers to lumping people into "us versus them" categories. They may idealize their current physician while denigrating former physicians. The same is often true for feelings about family members and friends. Manipulation is usually prevalent in this population, and these patients may occasionally dress inappropriately and be excessively flirtatious. Likewise, these patients benefit from preoperative psychiatric evaluation.

*The malingerer:* The malingerer fakes symptoms and illnesses. The motive is usually monetary, either from a presumed injury or through malpractice insurance from the physician. Like the personality disorder, this condition may cause the physician to feel uneasy. Usual findings during examination include complaints that are grossly out of character with physical findings.

*The depressed/manic patient:* The depressed patient complains of minimal joy in things they formerly found pleasing (*anhedonia*). They either have difficulty sleeping despite being tired, or sleep excessively with little sensation of rest. They complain of poor energy and motivation. Depression may be part of a grief reaction and therefore transient, or part of an underlying pathologic process. An adequate social and family history may discern between the two. The manic patient usually has flight of ideas, pressured speech and is disheveled in appearance. They rarely present for aesthetic surgery. Psychiatric evaluation may be helpful for both depressed and manic patients. Once treated, these patients are excellent candidates for surgery and may even show further improvement of symptoms after surgery.

*Body Dysmorphic Disorder:* More than half of Americans (43-56%) are unsatisfied with their appearance. Thus, body dissatisfaction is common. Body dysmorphic disorder (BDD), however, describes a group of patients with an inordinate concern for slight or imagined aesthetic defects. These patient's lives are significantly disrupted by their obsession with their perceived physical flaws. The most common focus of the patient's dissatisfaction is the skin, face, and nose. The incidence of the disorder has been estimated at 0.2% of the general population. This number is significantly higher (2-7%) in the population of patients presenting for cosmetic surgery. Sarwer described several disorders that often accompany BDD. These include obsessive-compulsive disorder, social phobia, eating disorders (anorexia/bulimia), gender identity disorder, and major depression. Identification of these problems should prompt a thorough search for symptoms of BDD. Multiple authors have indicated that patients with body dysmorphic disorder are not good candidates for aesthetic surgery as they are seldom, if ever, satisfied with the results. In fact, their symptoms may actually be exacerbated by surgery. These patients should not be considered for surgery and should be referred for a psychiatric care.

## **PATIENT REJECTION**

During the preoperative evaluation the surgeon should pay special attention to their "gut feeling" about the patient. A sense of unease should trigger a more in-depth evaluation and perhaps rejection of the patient. Authors Gorney and Goldman have delineated findings which, in their experience, should cause the surgeon to think twice about operating. These include patients who are single, immature, male, overly expectant, and narcissistic. They also warn against operating on the patient whom you don't like, who is rude to you or your staff, who lies to you or refuses to be photographed, and patients who want you to do something you can't deliver or feel is outside your aesthetic sense of what should be done.

Physicians do not commonly reject patients outright. They are usually referred to another physician or a repeat consultation session is scheduled. The patient may find another surgeon whom they prefer, or they may become tired of the apparent indecision by the surgeon and seek treatment elsewhere. Another common method is to schedule an initial consultation which is free of charge, but charge for additional consultations.

## **THE DISSATISFIED/LITIGINOUS PATIENT**

Despite a seemingly meticulous preoperative evaluation and successful surgical intervention, there will always be dissatisfied patients. When faced with an unhappy patient, the first impulse of the surgeon is often a defensive one. This should be avoided. Defensive posturing on the surgeon's part leads the patient to feel abandoned and unappreciated. The unappreciated and abandoned patient is more likely to be litigious. Thus, the physician must listen to these patients patiently. Listening is often therapeutic and does not imply agreement. Restating the patient's concern will help the surgeon to understand their complaint, and will reassure the patient that he or she is being listened to. If the surgeon feels the patient is correct in their concern, the surgeon should be forthright, and if necessary, offer revision surgery. If the surgeon does not feel revision is warranted, return visits at regular intervals may be scheduled. Concerns and dissatisfaction often resolve with time.

## **CONCLUSION**

Preventing patient dissatisfaction depends upon proper patient selection. The selection process begins with the initial interview. Any patient that makes the surgeon uncomfortable should at the minimum have surgery delayed, and perhaps referred for psychiatric evaluation. The most commonly diagnosed psychological conditions which should make the surgeon concerned include: neurotic disorders, personality disorders, psychotic disorders, depression/mania and body dysmorphic disorder.

## **FACIAL ANALYSIS**

### **INTRODUCTION**

Although facial beauty may be difficult to define, it is important for the Otolaryngologist to adopt an objective and systematic method of preoperative evaluation of patients seeking aesthetic surgery. This will not only enhance the surgeon's ability to identify flaws within the facial subunit in question, but will also ensure that equally important abnormalities in other subunits do not go undetected. The currently accepted norms of facial analysis have a long history. The Greek Polycleitus (450-420 B.C.) was the first to quantify symmetries and proportions and describe the canon of facial analysis. His sculpture of Doryphorus was intended to represent these ideal relationships. Leonardo Da Vinci (1452-1519) reported extensively on the proportions of the human body. He was the first to describe the three vertical divisions of the face. His canon of facial and body proportions were also reflected in his art. Durer (1471-1528) also created a canon of facial proportions. He felt his measurements should be used by artists to guide their compositions. He was the first to report that the intercanthal distance is equal to the width of an eye, and divide the lower face in to equal fourths. Jacques Joseph (1865-1934), also known as the father of rhinoplasty, reported extensively on the measurements of the nose. B. Holly Broadbent (1894-1977) introduced the use of radiographic cephalometrics to evaluate facial proportion. R.M. Ricketts popularized the golden proportion (1:1.618). L.G. Farkas was responsible for revising the classic canon based on multiple soft tissue studies. He also described how ethnic faces differed from the accepted canon.

Farkas and others showed that few people, Caucasian or ethnic, fit the neoclassical canon of fixed proportions and ratios. Yet, beauty has been shown to be consistent even across cultural groups. Studies have shown that symmetry and “averageness” is associated with beauty by infants, children and adults in multiple cultures. Interestingly, extreme beauty is associated with magnification or diminution of at least one feature. Multiple studies have shown that those who are deemed “beautiful” by their societies are given deferential treatment, rise to the top of their work fields earlier, are less likely to be reported or convicted of crime, and even wait shorter amounts of time for services.

### **ANATOMICAL LANDMARKS**

Prior to any discussion of facial analysis, a basic understanding of the important landmarks is required. The superior boundary of the forehead is the trichion which is located at the frontal hairline. Inferiorly the forehead slopes anteriorly to the glabella. The nose has several important landmarks including the often-referenced nasion, which is the depression at the root of

the nose corresponding to the nasofrontal suture. The rhinion corresponds to the bony-cartilaginous junction and the tip-defining point is the most anterior point of the nasal tip. The subnasale is another frequently used reference point that is located at the junction of the columella and the upper lip. The primary landmarks of the lips are the vermilion borders (mucocutaneous junctions) and the stomion where the upper and lower lips come together. Moving inferiorly, the lower lip transitions into the chin at the mentolabial sulcus and the most anterior point on the chin is termed the pogonion. The menton is the lowest point on the chin curvature. The gnathion is located where a line tangent to the pogonion intersects a line tangent to the menton. The cervical point is located where a line tangent to the menton intersects another tangent drawn along the anterior border of the neck. Finally, the tragion is located at the supratragal notch and is an important landmark for determining the standard horizontal position of the face. There are also multiple lines and angles used to objectively evaluate facial structures and these will be defined as they are presented.

## **METHODOLOGY**

There is a large body of literature discussing various techniques to analyze the face as a whole as well as its individual subunits. Perhaps more important than the specific technique used is the constant use of the same technique. Ideally, the technique will allow thorough evaluation of each subunit as well as how the subunits relate to each other to determine overall facial harmony. While more experienced surgeons may not require a rigid, systematic approach, the younger facial plastic surgeon may fail to recognize subtle abnormalities or disproportions if such a step-by-step approach is not utilized. With this in mind, Hom and Marentette developed an eight step approach to facial analysis with the goals of providing a basic conceptual framework that reinforces the established facial proportional relationships. Initially the facial height, width and symmetry are evaluated on frontal view. Subsequent steps utilize the lateral view to determine facial height, projection (lateral view width), and the nose-lip-chin relationship. Finally, the individual subunits are carefully evaluated.

### ***Frontal view evaluation***

#### ***Step 1. Vertical height -***

From the time of Michelangelo, observers have noted that the face can be divided into equal thirds. The boundaries of the upper third are the trichion and the glabella, with the mid third extending from the glabella to the subnasale. The lower third extends from the subnasale to the menton. The lower third can be further subdivided into thirds with the stomion marking the inferior boundary of the upper third, and the lower lip and chin forming the lower two-thirds. While some have advocated evaluating only the mid and lower face in men with receding hairlines, others have stated that the appropriate superior border for the upper third can be determined in these cases by locating the most superior movement of the frontalis muscle.

#### ***Step 2. Width -***

The easiest way to evaluate the relative width of facial structures is to divide the face into vertical fifths with each fifth being equal to one eye width. This technique is also helpful at determining the appropriate width of several individual subunits and will be discussed further.

*Step 3. Symmetry -*

A midsagittal line is drawn and the symmetry of the various subunits (ears, eyes, eyebrows, nose, and mouth) is compared. This is also a good time to assess the overall facial shape which should be roughly oval.

***Lateral View evaluation:***

Prior to evaluating the patient's profile, it is important to assure appropriate head position. This has traditionally been accomplished by placing the Frankfort horizontal line parallel to the floor. The Frankfort horizontal line is drawn between the superior aspect of the external auditory canal (or through the trignon) and the infraorbital rim. A second technique to obtain the patient's natural horizontal head position is to have them fix their eyes on a point at eye level.

*Step 4. Vertical height -*

Again, facial height is divided into thirds as in step 1, and the equality of the thirds reassessed. The vertical placement of landmarks is also determined in this step. As stated above, the lower third can be further divided into thirds with the stomion separating the upper and mid thirds and the pogonion lying in the center of the lower subdivision.

*Step 5. Midface projection –*

To assess the midface position relative to the upper face, a second line is drawn from the nasion to the subnasale. This line should form an angle of 85 to 92 degrees when compared to the Frankfort horizontal line and is termed the zero meridian. If this line is excessively anterior, the midface is described as anteface, and if posteriorly, a retroface profile is present.

*Step 6. Lower face position -*

The position of the lower third of the face compared to the upper third is then established, again with the zero meridian providing the reference. A line is drawn from the subnasale to the pogonion. This line should lie at a ten degree posterior angle from the zero meridian. If the pogonion is placed significantly anteriorly, it is said to be protruding and if posteriorly, retruding.

*Step 7. Nose-Lips-Chin Position -*

At this point the relationship of the nose, lips and chin to each other is evaluated using Rickett's E (esthetic) line. This line is drawn from the nasal tip to the pogonion. The lips should lie just posterior to this line with the upper lip approximately twice as far from the line as the lower lip. If this is the case, no further evaluation of these structures is indicated at this time. If not, one of the three structures is malpositioned. Since the pogonion was evaluated in step 4 and 6, only the lips and nasal projection are further evaluated at this time. A quick assessment of nasal projection is provided using Goode's ratio which compares a line from the alar groove to the tip with a second line from the nasion to the tip. The ratio of the former to the later should be approximately 0.55 to 0.62. The anterior-posterior position of the lips is quickly evaluated by the Holdaway H (harmony) line. This line starts at the ideal pogonion and is drawn ten degrees anterior to a line from the pogonion to the glabella. The lips are appropriately positioned if they approximate this line.

## *Step 8. Evaluation of individual subunits -*

### Forehead

Although the forehead is rarely altered surgically, it is important to evaluate because of its relationship to other parts of the face. Additionally, certain aspects of the forehead may dictate the surgical approach as in the case of a receding hair line or the presence or absence of deep forehead creases. In regards to the normal contour of the forehead, men tend to have more prominent glabellar and supraorbital rim regions with women having a smoother transition into the midface.

### Eyes and eyebrows

Again the eyebrows differ between sexes with the ideal male brow placed at the supraorbital rim and fairly flat. The female brow rest slightly superior to the rim and has a more prominent arch located at the level of the lateral limbus. The brow should start medially at a vertical line that passes through the alar groove and medial canthus, and continue laterally to end along an oblique line from the nasal ala through the lateral canthus at roughly the same height as the medial brow. Careful exam to rule out brow ptosis is extremely important if blepharoplasty is being considered. The intercanthal distance is usually 30 to 35 mm and can readily be evaluated when the frontal view is divided into vertical fifths with this distance equal to one eye width. Both upper and lower lids should be carefully examined both visually and manually to determine their shape and elasticity. The upper lid margin should have its highest point at the junction of its middle and medial thirds and the lower lids lowest point should be between the middle and lateral thirds. The upper lid should cover 2 to 3 millimeters of superior iris and the lower lid margin usually approximates the inferior iris. Lagophthalmos may be identified by having the patient look down while tilting the head backward. The superior palpebral lid crease identifies the attachment of the levator aponeurosis into the orbicularis muscle and should be located approximately 9 mm from the eyelash line. The presence and location of fat pseudoherniation should be determined and an inferiorly displaced lacrimal gland noted if present. Horizontal laxity of the lower lid can be tested by pulling the lid away from the globe and then releasing it. In the normal lid, it should snap back. If it returns slowly or not at all, significant laxity exists. Also the strength of the orbicularis muscle should be checked by having the patient close their eyes tightly while the examiner attempts to open them manually.

### Nose

In addition to the initial evaluation presented above, the nose should be evaluated for dorsal deformities and appropriate width on frontal view. Again, dividing the face into vertical fifths helps quickly determine whether an acceptable lower nasal width is present. The alar width should be equal to one eye width (one fifth the facial width) in Caucasians. Wider noses are acceptable in Asian and African-American faces. This distance may also be evaluated by determining the length of the nose from nasion to tip, with the width being approximately 70% of the length. On profile view nasal projection, rotation and length as well as the nasofrontal, nasofacial and nasolabial angles are more closely evaluated. The nasofrontal angle is formed at the nasion by lines that extend from this point to the glabella and to the nasal tip. This angle should ideally be 120 to 135 degrees. The position of the vertex of this angle (nasion) is also important because moving it up or down will lengthen or shorten the nose, respectively. Its usual position is at the level of the superior limbus of the eye. Nasal tip projection is often difficult to determine and many techniques have been advanced. Goode's ratio of 0.55-0.6:1 when

comparing projection to nasal length has been presented above. Another method involves the nasofacial angle which is formed by a line along the nasal dorsum intersecting a line from the glabella to the pogonion. The ideal nasofacial angle is 36 degrees. Nasal length, height and projection may also be examined simultaneously by creating a right triangle between the alar groove, the tip defining point and the nasion. The projection, height and length should create sides with a ratio of 3:4:5 respectively. Finally, an easy but often inaccurate method of determining projection compares it to the length of the upper lip from subnasale to vermilion border with the two being roughly equal. The fault with this technique lies in the variability of the upper lip length. Tip rotation is assessed by evaluation of the nasolabial angle which is formed by lines along the columella and upper lip that intersect at the subnasale. The ideal nasolabial angle for women is 100 to 120 degrees and men between 90 and 105 degrees. Also on lateral view, the alar and lobular lengths should be equal and there should be between 2 and 4 mm of columellar show. On basal view, the nose should have the shape of an equilateral triangle and the columella should be approximately twice as long as the lobule. The lobule should be 75% as wide as the alar base and the nostrils should be roughly pear shaped.

### Lips

The relative position of the lips as compared to the nose and chin have been discussed. It must be remembered that these structures as well as the patient's dentition will affect the appearance of the lips. Other considerations include the width of the lips, the interlabial gap and the degree of incisor show with smiling. The oral commissures should be located along vertical lines drawn from the medial limbus of the iris. Also, the lower lip should be slightly more full than the upper lip. When relaxed and with teeth in occlusion, the lips should approximate one another with an interlabial gap of 3 mm being the upper limit of acceptable. When smiling, there should be no gingival show and no more than two thirds of the maxillary incisors exposed.

### Chin and neck

The relative position of the chin has been determined in the initial evaluation and further evaluation is aimed mainly at the shape of the chin and its relation to the neck. The mentolabial sulcus depth is assessed by creating a line from the lower vermilion border to the pogonion. The sulcus should lie approximately 4 mm behind this line. In regards to the neck, Dedo developed a classification system based on the depth of the abnormality proceeding from superficial, skin and fat, to deep, muscle (platysma) and bone (chin or hyoid). Class I is the youthful, normal neck. Class II and III represent early abnormalities of skin and fat accumulation, respectively. When platysmal abnormalities such as banding are identified, Class IV is defined, and the loss of an appropriate mentocervical angle because of a posteriorly positioned chin is labeled Class V. Finally Class VI results from an inferiorly placed hyoid bone. Class VI is particularly important to identify because very little can be done surgically to correct this abnormality. Lastly, the appropriateness of the neck length can be determined by comparing the distance from menton to suprasternal notch, to the head height measured from menton to vertex, with the head being approximately twice as tall as the neck.

### Ear

The auricular length should be slightly less than twice its width and the long axis should be inclined approximately 20 degrees posteriorly. The external auditory canal should be located at a level roughly halfway between the lateral canthus and the nasal base. The superior aspect of

the ear should be at the level of the lateral brow and the inferior aspect at the level of the nasal base. The auriculocephalic angle should measure approximately 20 to 30 degrees. Specific landmarks of the ear including the helix, antihelix, scaphoid fossa, tragus, and lobule should be evaluated for obvious deformity. The thickness and flexibility of the cartilage should also be estimated.

#### Dental occlusion

As mentioned above, the patient's dentition may play a significant role in overall cosmesis. Although an in depth discussion is beyond the scope of this discussion, the dentition should be evaluated and correction considered if abnormalities are present that could cause aesthetic problems. Briefly, normal occlusion is present when the mesiobuccal cusp of the maxillary first molar occludes the buccal groove of the mandibular first molar. This is termed Type I occlusion. Type II occlusion occurs when the mandibular teeth occlude in a more posterior position and Type III occlusion is when they are more anteriorly located.

## **CONCLUSION**

While there are many ways to approach facial analysis, it is important that the technique used be easily remembered and applied. In this way, a routine, systematic approach may be developed that should help maximize the evaluation of the subunit in question while minimizing the risk of overlooking other important abnormalities. The technique described here initially evaluates several general facial parameters on both frontal and profile views, and then looks at specific subunits in more detail.

From the moment the physician walks into the examination room he or she is acting in several roles. As a physician he or she must evaluate the patient's general health and physical ability to undergo surgery. As a therapist, the surgeon must be able to listen to patient concerns and respond in a way that is helpful to the patient. Communication skills are paramount. As a psychiatrist he or she requires an in-depth understanding of patient motivation with an ability to identify psychiatric disorders. As an artist, a surgeon must maintain a clear picture of outcome limitation and be able to perform objective facial analysis with an artist's flair.

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