Evidence-Based Medicine
Rhinoplasty

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KEYWORDS

• Evidence based medicine • Functional rhinoplasty • Nasal valve stenosis • Cosmetic rhinoplasty • Aesthetic rhinoplasty • Systematic reviews

KEY POINTS

- Outcomes in rhinoplasty can be assessed by subjective, objective, and clinician-reported measures.
- Use of validated measures ensures reliability and consistency in outcomes reporting.
- Although most studies demonstrate near-universal support for the efficacy of functional and aesthetic rhinoplasty techniques, future studies should emphasize use of validated outcome measures when reporting data.
- Although level 1 evidence studies are currently rare in rhinoplasty literature, evidence-based medicine can be applied to rhinoplasty based on the wealth of data available from case reports, case series, cohort studies, experiments without controls, statements of expert opinion, and basic science research.

INTRODUCTION

The practice of evidence-based medicine has become increasingly prominent in the climate of modern day health care. The current pace of technologic innovation has led to the rapid development of novel medical therapies, each necessitating proof of efficacy, safety, and utility. Increasingly, physicians have come to consider evidence-based decision-making as the standard of care, a development that has been paralleled by matching expectations from patients. Far from replacing the traditional teachings of medicine, evidence-based medicine requires the integration of clinical experience and expertise in conjunction with the best available evidence and individual patient values and preferences.[1]

The Oxford Center for Evidence-Base Medicine has developed one of the most widely recognized classifications systems for critically appraising the strength of clinical evidence. At the upper echelon of this 5-tiered schema are systematic reviews of randomized controlled trials (level 1 evidence), followed by comparison cohort studies (level 2), case-control studies (level 3 evidence), case series (level 4), and expert opinion and bench research (level 5). A common mistake is the assumption that higher levels of evidence invariably represent better evidence. This is particularly relevant to the surgical specialties because level 1 evidence data are rare given the inherent ethical concerns in randomizing patients into a placebo treatment (ie, sham surgery) group. Fortunately, although the prevalence of level 1 evidence data may be relatively limited in facial plastic and reconstructive surgery, advancement of knowledge may occur through alternative study designs, including cohort

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studies, experiments without controls, uncontested expert opinion, or basic scientific research.[1] These types of studies have helped facial plastic surgeons navigate a world in which evidence-based medicine is not considered a luxury but, instead, the standard of care.

The term rhinoplasty when used broadly refers to surgery of the nose that is undertaken either to improve aesthetics, nasal function, or both. When the primary goal of surgery is to improve the appearance of the nose, this is typically specified as aesthetic or cosmetic rhinoplasty. When the primary goal of surgery is to improve nasal function by repair of an anatomic source of obstruction, it is referred to as functional rhinoplasty or nasal valve repair, with these terms often used interchangeably. The goal of this article is to provide a brief summary of current outcomes data regarding functional and aesthetic rhinoplasty surgery to help facilitate evidence-based clinical decision-making.

FUNCTIONAL RHINOPLASTY

Outcome Evaluation in Functional Rhinoplasty

Assessing clinical outcomes following functional rhinoplasty surgery has remained a highly controversial topic. It has long been recognized that significant incongruities can exist between a patient's self-reported severity of nasal obstruction and objective measurements of nasal valve function.[2] The nasal valve defines the area of the nasal passages with the smallest cross-sectional area and, therefore, the highest resistance to airflow. Traditionally, it is taught that the nasal valve has 2 components, internal and external, that can be involved with nasal valve compromise and nasal obstruction. The internal nasal valve is defined by the caudal edge of the upper lateral cartilages, the septum, and the anterior inferior turbinate. The angle formed between the upper lateral cartilage and the dorsal septum is critical for maintaining patency of the internal nasal valve, with the normative range being between 10° to 15°. The external nasal valve is defined by the nasal ala, caudal septum, the caudal aspect of the lower lateral cartilages, and nasal sill.[3]

More recent nomenclature has taken into account the dynamic nature of nasal valve obstruction, using the term lateral wall insufficiency (LWI) to refer to the inspiratory collapse of the lateral wall.[4] LWI can be further divided into 2 zones (**Fig. 1**). Zone 1 is located more cephalad and corresponds to the scroll region and inferior upper lateral cartilage. Zone 2 is akin to the traditionally described external valve. It is located caudal to Zone 1 and corresponds to the skin and soft tissues of the nasal ala.

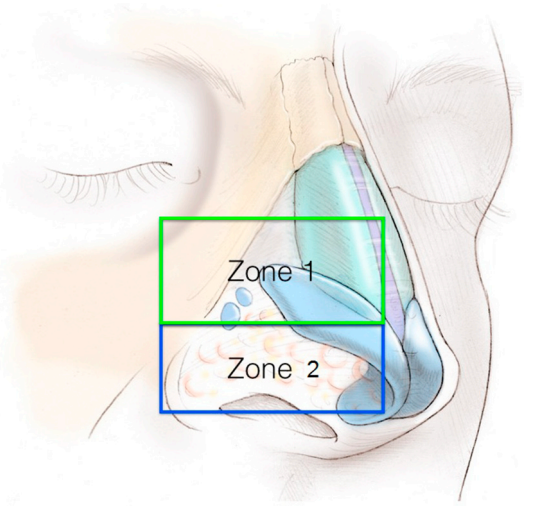

Fig. 1. Green box, Zone 1, corresponds to the scroll region and inferior upper lateral cartilage. Blue box, Zone 2, akin to the traditionally described external nasal valve.

Generally, assessment of treatment efficacy and outcomes in functional rhinoplasty can be divided into 3 categories: objective measures of nasal function, patient-reported measures, and clinician-derived measures.

Objective anatomic measures

Objective measures can be further subcategorized as either anatomic (measuring structural dimensions) or physiologic (measuring functional or biological parameters).[2] There is much debate regarding the value of objective measures in the assessment of nasal valve compromise and clinical nasal obstruction and, as such, these are used primarily for research purposes instead of for clinical decision-making.

Objective anatomic measures include acoustic rhinometry and radiographic studies assessing nasal cavity dimensions and geometry. Acoustic rhinometry is a diagnostic measure that uses acoustic reflections to calculate nasal airway cross-sectional area as a function of longitudinal distance along the nasal passageway. Nasal passage volumes can then be calculated from contiguous cross-sectional values. This allows for assessment of the dimension of the nasal airway at specific points along the nasal passage.[5] Although its clinical applications are still debated, acoustic rhinometry has seen widespread adoption in clinical research with more than 500 studies published since the late 1980s.[6] Importantly, acoustic rhinometry is a static measurement of nasal dimensions and, therefore, measurements may vary depending on the degree of current nasal congestion. It is, therefore,