

Essentials of Septorhinoplasty

Philosophy—Approaches—Techniques

Second Edition

Hans Behrbohm
M. Eugene Tardy, Jr.

With contributions from

Wibke Behrbohm
Randolph B. Capone
William Dougherty
J. Eichhorn-Sens
Wolfgang Gubisch
Mario Hensel
Thomas Hildebrandt
Dieter Jaeger
Oliver Kaschke
Gunter Mlynski

Ira D. Papel
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Zrria L. White



 Thieme

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Hans Behrbohm, MD, PhD

Professor and Director

Department of Otolaryngology, Facial Plastic Surgery

Park-Klinik Weissensee

Teaching Hospital of the Charité University Hospital

Berlin, Germany

M. Eugene Tardy, Jr., MD, FACS

Professor Emeritus and Former Director

Division of Facial Plastic and Reconstructive Surgery

University of Illinois at Chicago

Chicago, Illinois, USA

With contributions from:

Wibke Behrbohm, Randolph B. Capone, William Dougherty, J. Eichhorn-Sens, Wolfgang Gubisch,

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J. Regan Thomas, Dean M. Toriumi, Zrria L. White

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Preface



Photo: Vincent Mosch

The cover of this textbook shows the face of Athene protecting a young hero. The statue is located on the *Schlossbrücke* (Castle Bridge) in the center of Berlin. Based on a design by Karl Friedrich Schinkel, it was created by Gustav Bläser in 1854 in Carrara marble in the neoclassical style.* Athene is the goddess of wisdom, art, battle, and strategy.

Like Athene, this book should encourage young surgeons to adopt well-considered strategies and make effective surgical decisions, and sensitize them to the artistic aspects of rhinoplasty as a complex and integral part of facial plastic surgery. At the same time, let us ask the goddess for good *fortune*, which is essential for every surgeon.

Fourteen years after publication of the successful and award-winning first edition of *Essentials of Septorhinoplasty*, we are pleased to present you the second edition. A very warm thank you goes to our readers for their sustained interest in our book, which was the most important precondition for a second edition.

It was a pleasant experience that all authors of the first edition immediately agreed to participate in preparing this new edition, which was achieved in a short period of concentrated work. Several new authors joined us, adding new and important topics.

My personal, special thanks go to my coeditor M. Eugene Tardy Jr. for his formative influence, support, and friendly collaboration over the last 15 years—in the first and second editions of this

book, in joint dissection courses in the Institute of Anatomy of the Charité University Hospital, and in other long-term projects. Retrospectively, I realize how crucial his philosophy, surgical conservatism, sensitive approach to this field of medicine, and high demand for atraumatic surgery influenced my personal technique of rhinoplasty.

It is my firm belief that the ideal outcome in rhinoplasty can only be achieved with a twofold goal: preserving the physiological elasticity of the nose as a flow body and maintaining the appearance of a natural, individual *nonoperated* nose. To achieve both goals, closed and open techniques are required in the repertoire of a well-trained rhinoplasty surgeon.

Additional thanks go to the artists Bob Brown, Katja Dalkowski, MD, and Vincent Mosch, who gave this edition an inimitable charisma.

My sincere thanks go to our patients who generously agreed to the publication of their portrait photographs.

A major share in the realization of this new edition goes to Mr. Stephan Konnry, my editor at Thieme, and Ms. Nidhi Chopra, who, although working from far away, was always closely involved in the preparation of this new edition.

We hope that the new edition of *Essentials of Septorhinoplasty* will again find many interested readers and help them achieve many successful and beautiful rhinoplasty outcomes.

Hans Behrbohm, MD, PhD

*The Young Hero (statue on the left of Athene) illustrates the cover of Behrbohm et al. *The Nose—Revision and Reconstruction* (Thieme, 2016).



Neo Rauch, Die Vorführung (Performance), 2006.

With permission from Neo Rauch; Courtesy Galerie EIGEN+ART Leipzig, Berlin; Gallery David Zwirner New York, London; Photo Uwe Walter, Berlin; © Neo Rauch; VG Bild Kunst.

Rhinoplasty is a public performance. The stage is the everyday life. Sometimes it is a great theatre—quite often a poem. The human face is the most fascinating thing in this world, and it has to be handled with great care.

The question of whether aesthetic surgery can make people happy or not is controversial and disputed. Everyone has their own definition of happiness. Most candidates of rhinoplasty

come to us because they hope to be happier by becoming more attractive. The hope of becoming both happier and more attractive is in fact justified, because patients tend to be more self-confident and content following a successful operation. In this sense, a positive result of a rhinoplasty can make people happy.

Contributors

Hans Behrbohm, MD, PhD

Professor and Director
Department of Otolaryngology, Facial Plastic Surgery
Park-Klinik Weissensee
Teaching Hospital of the Charité University Hospital
Berlin, Germany
Institute of Medical Development and
Further Education Berlin e.V.
Berlin, Germany

Wibke Behrbohm

Dentalzentrum Pankow
Berlin, Germany

Randolph B. Capone, MD, FACS

Assistant Professor
Department of Otolaryngology–Head and Neck Surgery
The Johns Hopkins University School of Medicine
Director, The Baltimore Center for Plastic Surgery
Baltimore, Maryland, USA

William Dougherty, MD

Resident
Otolaryngology Head and Neck Surgery
University of Virginia
Charlottesville, Virginia, USA

J. Eichhorn-Sens, MD, PhD

Plastic and Aesthetic Surgeon
Practice for Aesthetic and Reconstructive Nose Surgery
Berlin, Germany

Wolfgang Gubisch, MD, PhD

Professor and Senior Director
Department of Facial Plastic Surgery
Marienhospital Stuttgart
Stuttgart, Germany

Mario Hensel, MD, PhD

Department of Anesthesiology and Intensive Care Medicine
Park-Klinik-Weissensee
Berlin, Germany

Thomas Hildebrandt, MD

Limmatklinik AG Zurich
Zurich, Switzerland

Dieter Jaeger

Potsdam, Germany

Oliver Kaschke, MD

Professor and Director
Department of Otorhinolaryngology–Head and Neck Surgery,
Facial Plastic Surgery
St. Gertrauden Hospital
Teaching Hospital of the Charité University Hospital
Berlin, Germany
Institute of Medical Development and
Further Education in ENT Berlin e.V.
Berlin, Germany

Gunter Mlynski, MD

Professor Emeritus
Stolpe, Germany

Ira D. Papel, MD, FACS

Associate Professor
Facial Plastic and Reconstructive Surgery
The Johns Hopkins University
Baltimore, Maryland, USA

Stephen S. Park, MD

Professor and Vice Chair, Department of Otolaryngology
Director, Division of Facial Plastic Surgery
University of Virginia
Charlottesville, Virginia, USA

Stephen W. Perkins, MD

Clinical Associate Professor
Department of Otolaryngology–Head and Neck Surgery
Indiana University School of Medicine
President and Founder
Meridian Plastic Surgery Center and Meridian Plastic Surgeons
Indianapolis, Indiana, USA

Wolfgang Pirsig, MD

Professor Emeritus
Ulm, Germany

Wolfram Seidner, MD

Professor Emeritus
Berlin, Germany

Scott Shadfar, MD

Aesthetic Institute of Oklahoma
Edmond, Oklahoma, USA

M. Eugene Tardy, Jr., MD, FACS

Professor Emeritus and Former Director
Division of Facial Plastic and Reconstructive Surgery
University of Illinois at Chicago
Chicago, Illinois, USA

J. Regan Thomas, MD

Mansueto Professor and Chairman
Department of Otolaryngology–Head and Neck Surgery
University of Illinois at Chicago
Chicago, Illinois, USA

Dean M. Toriumi, MD

Division of Facial Plastic and Reconstructive Surgery
Department of Otolaryngology–Head and Neck Surgery
University of Illinois at Chicago
Chicago, Illinois, USA

Zrria L. White, MD

Resident Physician
Department of Otolaryngology–Head and Neck Surgery
University of Illinois at Chicago
Chicago, Illinois, USA

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Chapter 1

The Dual Character of Nasal Surgery

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1 The Dual Character of Nasal Surgery

Hans Behrbohm

1.1 Introduction

Young sailors in the International Optimist class trim their sails with the help of a tensioning pole called a sprit. The stronger the wind, the more tightly the sprit is set. The lower the tension on the sprit, the more the sail will billow open. This change in the shape of the sail is clearly reflected in the adjacent top triangles.

A similar mechanism is at work in the nose. The height and tension of the anterior septum significantly affect the aperture angle of the nasal valve and the tension and shape of the tip and supratip area.

The goal of any structure-conserving surgery of the nose, as in the spritsail, is to change the shape of the internal and external nose by altering the tension and traction on specific structural elements (**Fig. 1.1**).

The nose performs a variety of functions. It is a respiratory and sensory organ and has a special aesthetic importance as a central feature of the face. It is a reflex organ and adds resonance to phonation. The functional and aesthetic aspects of the nose are inseparably linked in a morphological sense.¹ It is our experience that functional and aesthetic problems of the nose almost always coincide. Rhinosurgery aimed exclusively at improving function will very quickly reach its limits if it disregards external form. This is clearly illustrated by the “tension nose,” deviated nose, and saddle nose.

Conversely, rhinosurgery that is done purely for aesthetic goals forfeits valuable opportunities, as in the cases where the impact of septal surgery on nasal tip aesthetics is not used to modify tip definition, projection, and rotation.^{2,3}

Goldman found that in more than 70% of his cases, the presence of septal deviation coexisted with a deformity of the external nose.⁴ Meyer performed a concomitant septoplasty in 80% of his primary and secondary rhinoplasties.⁵ Masing explained the importance of external nasal shape in

respiratory function by noting the smaller cross-sectional areas of the external nose compared with the internal nose.⁶

Farrior states that surgical correction of the external nose is often the prerequisite for normal, unobstructed nasal breathing.⁷ Our own experience confirms the results of Schulz-Coulon,⁸ who addressed the question of whether rhinoplasty is a predominantly aesthetic or functional procedure.⁹ When statistical analysis was applied based on patients' motivations for surgery and their satisfaction or dissatisfaction with the outcome, this question could not be answered in terms of a predominantly aesthetic or functional operation. This led the author to agree with Haas that both terms should be discarded in favor of the more accurate term, *corrective rhinoplasty*.^{8,10}

But the concept of functionality does not apply just to the improvement of nasal breathing. It includes the following aspects as well:

- Peripheral olfactory disturbances.
- Recurrent and chronic sinusitis.
- Middle ear ventilation problems.
- Rhinogenic headache.
- Poor vocal quality.
- Nasal ventilation problems due to rhonchopathy.

Functional-aesthetic rhinoplasties are among the most demanding procedures in facial plastic surgery. In themselves, they pose a significant challenge to the rhinosurgeon. It is logistically and technically feasible to include the above indications without getting lost in too many details while still addressing the patient's desire to solve multiple problems in a single operation.¹¹

Surgeons should have all the techniques and approaches of rhinoplasty and endoscopic endonasal microsurgery in their repertoire. We caution against the current trend toward the exclusive use of the open approach, because the advantage of clear operative exposure is offset by a substantial increase in tissue trauma and subcutaneous scarring. Circumstances will dictate the best choice from among the available options: the *cartilage-splitting approach*, *delivery approach*, or *open approach* (**Fig. 1.2**). To avoid drawback of a limited overview of the depth of the surgical field in the closed techniques, the desire arose to adopt endoscopic surgical procedures in septoplasty and rhinoplasty for both functional and aesthetic indications.

The approach should be as effective as possible and as invasive as necessary. Minimizing surgical trauma is of key importance, as it is the best means that the surgeon has for influencing postoperative wound healing and scar formation. While surgeons can directly alter the size and position of cartilage and bone, they can influence wound healing, and ultimately the definitive outcome, only by working atraumatically in the appropriate favorable *surgical planes*, creating small and appropriate graft beds, and reducing bleeding by preserving the muscular and vascularized planes of the nose (**Fig. 1.3**).

Besides selecting the approach, surgeons can choose from among several techniques (incision, suturing, or grafting) to achieve the desired goal in various ways. Nevertheless, most techniques are rarely of equal suitability. The technique of choice will depend upon skin type, connective-tissue type, and factors such as the age of the patient and the resiliency of the cartilage.



Fig. 1.1 As in a sail, the shape and function of the nose can be influenced by altering (cartilage) tensions.

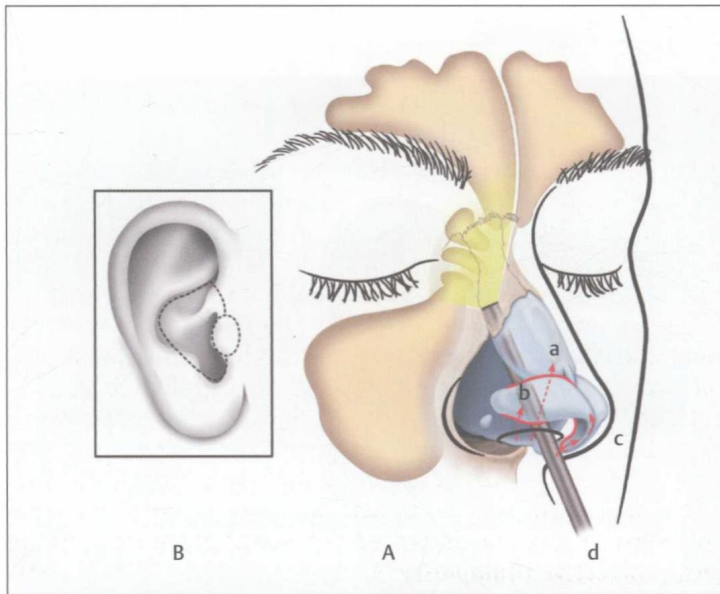


Fig. 1.2 (A) All approaches to the nasal tip and nasal dorsum can be combined with the endoscopic endonasal approach to the internal nose and paranasal sinuses. (a) Intercartilaginous or transcartilaginous route. (b) Alar cartilage rim incision combined with intercartilaginous incision in the delivery approach. (c) Columellar incision, columellar rim incision, and alar cartilage rim incision in the open approach. (d) Endoscopic approach to the posterior septum and ethmoid—the gateway to the paranasal sinuses. (B) “The external ear exists as a marvelous storehouse of skeletal spare parts for the nose.” M.E. Tardy Jr.¹⁰⁷

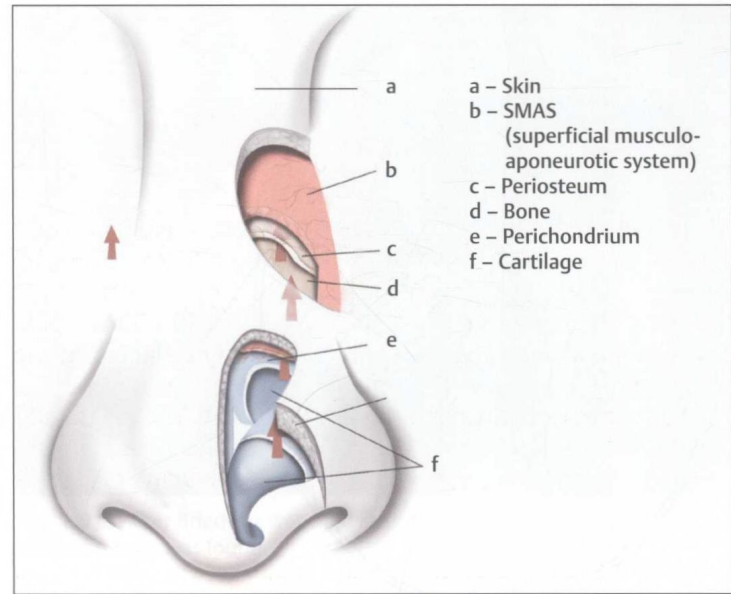


Fig. 1.3 The surgical plane in septorhinoplasty.

1.2 Historical Review

1.2.1 Origins of Plastic Nasal Surgery

Partial or complete loss of the nose causes severe disfigurement of the face. This kind of trauma injures not just the human body, but also the mind. The destruction of the aesthetic and psychological integrity of a personality is among the cruelest testimonials of bygone eras. Many ancient sculptures bear witness to this act in symbolic form.^{12,13}

Cutting off the ears and nose as a form of punishment motivated the earliest attempts at reconstructive plastic surgery in India approximately 1,500 years ago.^{13–15} The *Indian rhinoplasty* was performed with a midline forehead flap in a concept that resembles methods still in use today. This technique was described by Sushruta in approximately 600 BC. Galenus mentioned that the Egyptians performed nasal operations, but they kept their methods a secret.¹⁴

Much later, around 1430, the Branca family (first the father, later the son) developed a procedure for reconstructing the nose with a flap from the upper arm.

Gaspare Tagliacozzi (1545–1599), writing in the first textbook on plastic surgery, described techniques for nasal reconstruction that he adopted from Branca and refined. Although that occurred about a century after the Brancas used the upper arm flap, Tagliacozzi is still considered the founder of *Italian rhinoplasty*.^{12,14–16}

The human desire for the aesthetic rehabilitation of traumatic or congenital disfigurement, with an opportunity for social reintegration, was definitely the original motivation for reconstructive rhinoplasty.

The age of corrective aesthetic rhinoplasty was inaugurated by John Orlando Roe (1848–1915), an otorhinolaryngologist from Rochester, New York. This surgeon corrected saddle nose deformities through an endonasal approach.¹⁷ In 1891, Roe also used intranasal approaches for dorsal hump removal.^{6,14} Innovations in the functional aspects of rhinoplasty were later introduced by Mink, van Dishoek, Cottle, and others.^{18–20}

1.2.2 The Development of Plastic Surgery in Berlin and at the Charité Hospital from the 18th to 20th Centuries

Surgeons and rhinologists who practiced in Berlin from the 18th to the 20th centuries greatly influenced the subsequent development of functional–aesthetic rhinosurgery.

Carl Ferdinand von Graefe (1787–1840) was appointed from Wilhelm von Humboldt (1767–1835) as a first professor in ordinary of the Institute of Clinical and Ophthalmological Surgery at the newly founded Friedrich-Wilhelm University in Berlin in 1810 when he was just 23 years old. He was a skilled surgeon who had a keen interest in plastic surgery of the face and jaws. He performed the first successful repair of a cleft palate in 1816. For autologous nasal reconstruction, he used both the Indian and Italian techniques and added his own refinements. He corrected deformities of the face, especially those involving the lips, eyelids, cheek, and nose^{21,22} (**Fig. 1.4**).

His son, Albrecht von Graefe (1828–1870) became the founder of ophthalmology as a medical specialty (**Fig. 1.5**). He developed several principle surgical techniques for the therapy of cataract, strabismus, and glaucoma. He is the inventor of the ophthalmoscope.

Johann Friedrich Dieffenbach (1792–1847) succeeded von Graefe, who kindled his enthusiasm for facial plastic surgery. Dieffenbach dedicated himself to refining the plastic surgical procedures of his day. He did pioneering work in such areas as cleft lip and palate repair, blepharoplasty, the surgical correction of strabismus, and tenotomy for the treatment of clubfoot. He promoted modern rhinoplasty by developing a dual-flap technique that repaired both cutaneous and mucosal defects, thereby reducing the problem of flap shrinkage.

He became internationally known through his first strabismus operation and numerous monographs. Along with Guillaume Dupuytren of France, Ashley Cooper of England,

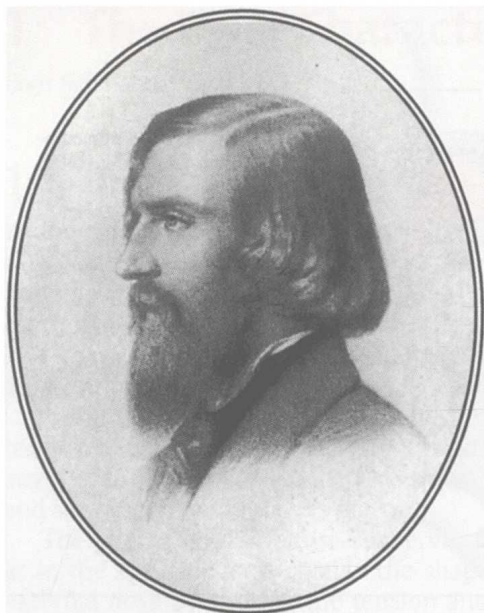


Fig. 1.4 Carl Ferdinand von Graefe (1787–1840).



Fig. 1.5 Albrecht von Graefe, the founder of ophthalmology.



Fig. 1.6 Johann Friedrich Dieffenbach (1792–1847).

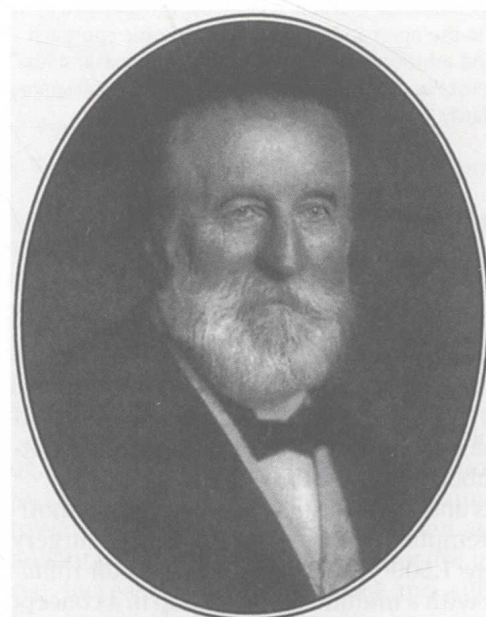


Fig. 1.7 Ernst von Bergmann (1836–1907).

and Nikolai Pirogow of Russia, Dieffenbach was among the greatest surgeons of his time and is considered the founder of plastic surgery^{22–24} (Fig. 1.6).

The following episode helped to establish Dieffenbach's special reputation in 19th-century Berlin: A charming young woman who attended society balls in 1831 and 1832 attracted considerable attention by always hiding her face behind a golden mask. Elvira Tondeau's secret was that her face had been disfigured by deep ulcerative lesions of the nose, presumably a result of tuberculosis cutis luposa. Dieffenbach was able to reconstruct her nose in several sittings. One year later, Elvira entered into a much-publicized engagement. Dieffenbach's accomplishment was immortalized in a contemporary folk song that claimed that "... he makes the nose and ears like new."²²

General anesthesia was developed in 1846, making painless surgery a reality. In 1878, Robert Koch published his paper "Studies on the etiology of wound infections." Joseph Lister (1827–1912) paved the way for germ-free operations. Bernhard von Langenbeck (1810–1887) was Dieffenbach's successor at the Berlin Charité Hospital, specializing in plastic surgery.

Langenbeck's successor, Ernst von Bergmann (1836–1907), was one of the most influential surgeons of his time, introducing the principle of asepsis to surgery. His guiding rule was that everything that came into contact with the operative field and especially with the surgical wound had to be absolutely sterile (Fig. 1.7).

Jakob Lewin (Jacques) Joseph (1865–1934) was a pioneer of modern rhinoplasty. He studied medicine in Berlin, graduated in Leipzig in 1861, and opened a private practice in Berlin. Shortly thereafter, he joined the Berlin University Orthopedic Hospital, headed by Julius Wolff (1836–1902), where he received extensive surgical training. In 1896, he was referred to the hospital for the correction of prominent ears.¹²

In 1898, Joseph performed the first reduction rhinoplasty at his office, using an external approach. He also did pioneering work in several other areas, including the treatment of both morphological and functional abnormalities in one sitting, the use of intranasal approaches, and the establishment of aesthetic surgery as a medical specialty.

It is "not vanity which is the driving motivation, but the feeling of being disfigured and, conversely, the aversion to