



The Vermilionectomy and the Subsequent Lower Lip Reconstruction Were Introduced by *Victor von Bruns* and not by *von Langenbeck* or *von Esmarch* as Reported Previously

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Summary: Vermilionectomy is an established procedure for the management of precancerous lesions of the lip and is often performed simultaneously with a lower lip resection for the treatment of a malignancy. The literature suggests that Dieffenbach or von Langenbeck or von Esmarch was the first to introduce this procedure. A systematic review of the German literature from the 19th century revealed that it was von Bruns who performed the vermilionectomy for the management of lip malignancies for the first time. (*Plast Reconstr Surg Glob Open* 2016;4:e699; doi: 10.1097/GOX.0000000000000697; Published online 5 May 2016.)

Vermilionectomy is an accepted technique for the therapy of precancerous conditions of the lower lip. It is performed simultaneously with reconstructive procedures after full-thickness lower lip resection in cancer cases. This technique provides a good functional and a favorable aesthetic result.¹ Vermilionectomy and subsequent reconstruction have often been sidelined as a necessary procedure in the history of lip reconstruction.^{2,3} In the

literature, the first description of vermilionectomy and the subsequent reconstruction were attributed to *von Langenbeck*,⁴ *von Esmarch*,^{5,6} *von Langenbeck-von Bruns*,^{7,8} and *Dieffenbach*⁹ among other authors.

THE EVOLUTION OF THE TECHNIQUE AND MISINTERPRETATIONS

In 1855, von Langenbeck described the use of full-thickness vermilion flaps based on the *philtrum* for reconstruction of a full-thickness rectangular lower lip defect in 2 patients,¹⁰ without providing an illustration. Von Esmarch, pupil of von Langenbeck, published an illustration of the von Langenbeck's technique including a transposition flap of the chin, not mentioned by von Langenbeck in the original report of 1855 (Fig. 1).¹¹ Von Langenbeck gave credit to Dieffenbach for the reconstruction of the vermilion with mucosa from the cheek together with the residual lower lip mucosa, pointing out that his procedure was different because of the use of full-thickness pedicled vermilion flaps.¹⁰ The covering of the reconstructed lip by means of mucosal flaps from the cheek or from the residual lip was routinely used in Germany at the beginning of the 19th century.^{12,13} This procedure was introduced by Wernek¹⁴ from Salzburg, Austria, and was relatively

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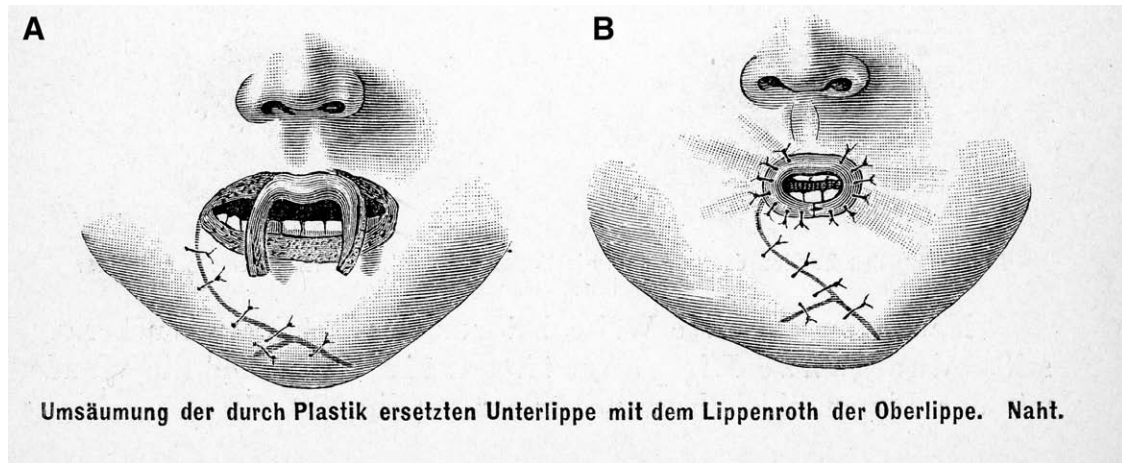


Fig. 1. A and B, “New technique for lip plasty through delivering and stretching of the vermilion” by von Langenbeck,¹⁰ translated from German (“Neues Verfahren zur Chiloplastik durch Ablösung und Verziehung des Lippensaums”). Drawing was published by von Esmarch and Kowalzig (1892). The supplementary transpositional flap from the chin was not mentioned in the original report by von Langenbeck¹¹ [2 drawings taken from the original (4 × 3.5 cm each) in Esmarch and Kowalzig¹¹].

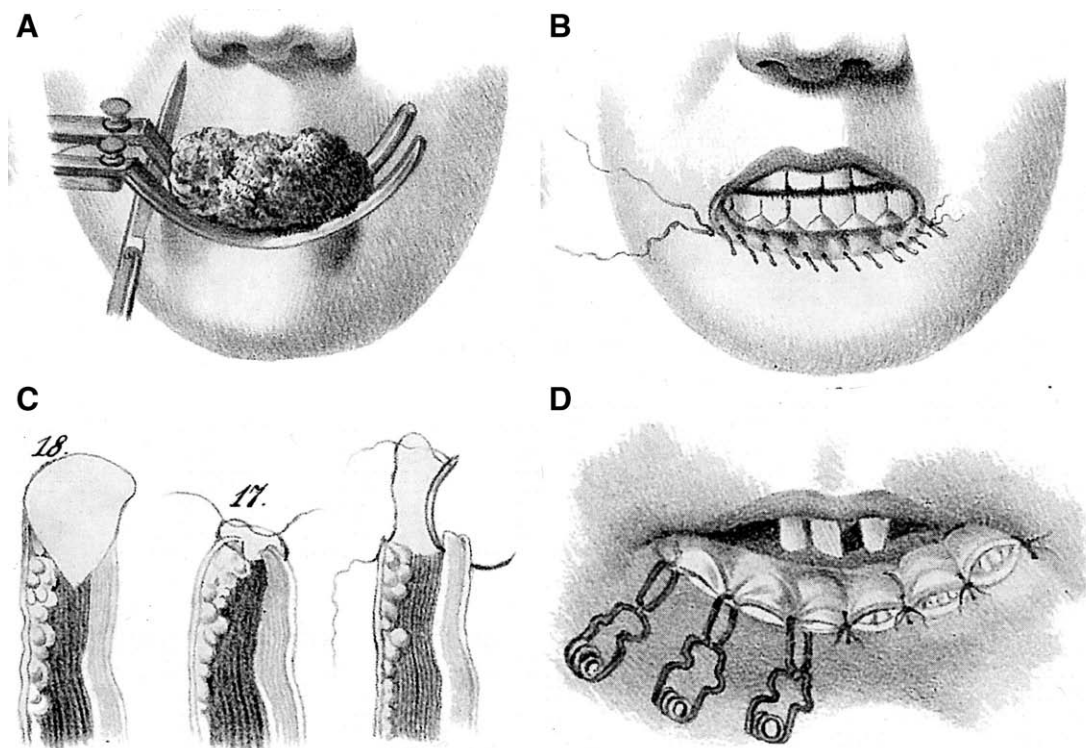


Fig. 2. Vermilionectomy as described by Victor von Bruns from the “Chirurgischer Atlas” from 1857.¹⁷ Legends translated from German: “Curved excision” (“Bogenschnitt”); (A), “lip mucosal lining after ‘Bogenschnitt’ using a continuous suture” (B), “Lateral view of the lip after ‘Bogenschnitt’ to explain the mucosal lining of the lip (three sections” (C), the wedge excision of the red lip (C, first section) is explained in von Bruns’s¹⁸ *Handbuch der praktischen Chirurgie* (1859) as a further description of the vermilionectomy by Kloze and Paul¹⁹; (D) “Lip mucosal lining after ‘Bogenschnitt’ using single stitches in the left lip side and using Serre-fines in the right lip side”. [4 drawings taken from the original, plate XII/division II (48.5cm x 33.3 cm) in von Bruns, 1857].¹⁷ The plate includes 45 drawings, each drawing sized 6cm x 4.5 cm). Reprinted with permission from Mohr Siebeck, Tuebingen, Germany.

well known before his publishing of this procedure in 1830 as a *Letter to the Editor*, December 10, 1829. Dieffenbach¹⁵ performed this procedure before Wernek's report, but Dieffenbach gave him the credit for this innovation in 1845. Busch et al¹⁶ stated that Wernek performed his procedure for the first time in 1817. The mucosal lining of the vermilion was used in microstomia cases, mainly after infection, or in combination with full-thickness lower lip resection combined with local flaps.

In 1857, von Bruns¹⁷ published an illustration of a vermilionectomy for the first time as a treatment of choice for small tumors followed by reconstruction of the vermilion in von Bruns' *Surgical Atlas*. This was achieved by means of an advancement of the remaining mucosa of the inner lip. Two years later, von Bruns published a corresponding textbook to the atlas (*Handbuch der praktischen Chirurgie*),¹⁸ where he explained the rationale of this procedure (Fig. 2). Von Bruns mentioned a further modification of the vermilionectomy by Klose and Paul in 1850,¹⁹ in which a wedge excision of the red lip was performed; a drawing of this technique, which had not been published before by the Klose and Paul, was included in von Bruns' *Surgical Atlas*; Klose and Paul had not provided an illustration in their original report (Fig. 2). It seems that the von Bruns' vermilionectomy was well known even before von Bruns published this technique in his atlas. This seemed to be the case, as Blasius¹³ criticized the von Bruns' vermilionectomy as a minimally invasive procedure in 1848. Günther and Kühn²⁰ gave von Bruns the credit of von Bruns' vermilionectomy and reconstruction; they also provided a drawing. The illustration was the von Bruns' clamp, which was used in this procedure.

Von Esmarch and Kowalzig¹¹ described the vermilionectomy, a technique that had not been mentioned after *Günther and Kühn's* report in 1866.²⁰ Von Esmarch and Kowalzig provided an own drawing without any conceptual change to the one originally described by von Bruns, omitting a credit to any author.

SUMMARY

The vermilionectomy was rarely performed in the 19th century. Red lip resection and reconstruction was just not considered as being worth mentioning. Blasius stated this in 1848, criticizing the von Bruns' technique in a report even before von Bruns had published this technique in his atlas.

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REFERENCES

- Roldán JC, Teschke M, Fritzer E, et al. Reconstruction of the lower lip: rationale to preserve the aesthetic units of the face. *Plast Reconstr Surg*. 2007;120:1231–1239.
- Zeis E. *Die Literatur und Geschichte der plastischen Chirurgie*. Leipzig, Verlag von W. Engelmann; 1863.
- Siegert R, Weerda H. The history of lip reconstruction. *Facial Plast Surg*. 1990;7:63–71.
- Weerda H. Coverage of defects in specific facial regions: the lips: Lower lip. In: Weerda H, ed. *Reconstructive Plastic Surgery*. Stuttgart: Thieme Verlag; 2001: 72–73.
- von Terheyden H, Fleiner B, Koch G. [Contour of the lower lip after von Esmarch reconstruction of lower lip vermilion]. *Mund Kiefer Gesichtschir*. 1997;1(Suppl 1): S113–S116.
- Carty M, Privaz J. Lip and cheek reconstruction. In: Siemionow M, Eisenmann-Klein M, eds. *Plastic and Reconstructive Surgery*. Heidelberg: Springer; 2010:326.
- Petres J, Rompel R. *Lippenregion: Operative Dermatologie: Lehrbuch und Atlas*. Heidelberg: Springer; 2006:826.
- Kaufmann R, Podda M, Landes E. Exzisionstechniken und Defektdeckungen in speziellen Lokalisationen. In: Kaufmann R, Podda M, Landes E, eds. *Dermatologische Operationen: Farbatlas und Lehrbuch der Hautchirurgie*. 3rd ed. Stuttgart: Thieme Verlag; 2005:138–140.
- Mazzola RF, Lupo G. Evolving concepts in lip reconstruction. *Clin Plast Surg*. 1984;11:583–617.
- Langenbeck von B. Neues Verfahren zur Chiloplastik durch Ablösung und Verziehung des Lippensaums. *Dtsch Klinik* 1855;7:1–3.
- Esmarch von F, Kowalzig E. Operationen am Kopf. Plastische Operationen im Gesicht. Die Cheiloplastik. In: Esmarch von F, Kowalzig E, eds. *Chirurgische Technik. Ergänzungsband zum Handbuch der kriegschirurgischen Technik enthaltend die übrigen Operationen*. Kiel and Leipzig: Lipsius & Tischer; 1892:55–56.
- Dieffenbach JF. Über die Bildung der Lippen bei Verschiebung des Mundes durch Überpflanzung der Schleimhaut. In: Dieffenbach JF, ed. *Chirurgische Erfahrungen besonders über die Wiederherstellung Zerstörter Theile des menschlichen Körpers nach neuen Methoden*. Berlin: Th. Chr. Fr. Enslin; 1829:40–48.
- Blasius E. Lippenbildung. In: Blasius E, ed. *Beiträge zur praktischen Chirurgie nebst einem Bericht über die chirurgisch-ärztliche Klinik der Königlichen Universität zu Halle*. Berlin: Verlag von A. Förstner; 1848:187.
- Wernek W. Über die künstliche Mundwinkel- und Lippenbildung durch blutige Umschlagung der Mundschleimhaut. *v Gräfe's v Walther's J Chir Augenh.* 1830:202–214.
- Dieffenbach JF. Mundbildung (Stomatoplastie). In: Dieffenbach JF, ed. *Die operative Chirurgie*. Leipzig: F. A. Brockhaus; 1845:427–428.
- Busch D, Gräfe von CF, Hufeland C, et al. Chiloplastik. In: Busch D, Gräfe von CF, Hufeland C, et al, eds.

- Encyclopädisches Wörterbuch der medicinischen Wissenschaften.* Berlin: Verlag J.W. Bock; 1831:462.
17. Von Bruns V. Excision des Krebses der Unterlippe. Organischer Wiederersatz der Oberlippe, Tafel XII. In: *Chirurgischer Atlas. Bildliche Darstellung der chirurgischen Krankheiten und der zu ihrer Heilung erforderlichen Instrumente, Bandagen und Operationen. Zweite Abtheilung: Kau- und Geschmacksorgan.* Tübingen: Verlag der H. Laupp'scher Buchhandlung, Laupp & Siebeck; 1857:12.
18. Von Bruns V. Äussere Weichteile. In: Von Bruns V, ed. *Handbuch der praktischen Chirurgie Zweite Abtheilung. Kau- und Geschmacksorgan.* Tübingen: Verlag der H. Laupp'scher Buchhandlung; 1859:568–575.
19. Klose C, Paul J. Chirurgisch-klinischer Bericht aus dem Hospital der Barmherzigen Brüder zu Breslau vom Jahre 1847–1849. Lippencarcinome (verschiedene Methoden der Operation). *Z Klin Med.* 1850;1:198.
20. Günther GB, Kühn J. Operationen an den Lippen und Wangen. Krebs an der Unterlippe. Extirpation. In: Günther GB, Kühn J, eds. *Lehre von den blutigen Operationen am menschlichen Körper.* Leipzig and Heidelberg: C. F. Winter'sche Verlagshandlung; 1866:32–33.