OPEN

PRS GLOBAL OPEN VIDEO
Operative Technique

The Unilateral Cleft Lip Repair and Primary Cleft Rhinoplasty

Jacques X. Zhang, BSc (Hons)*; Vivek Kumar, MS, MBBS†; Jugpal S. Arneja, MD, MBA‡

VIDEO DESCRIPTION

Indications for Operation

Cleft lip repair is indicated for all patients with a cleft lip after obtaining informed consent, unless the patient has malnutrition, anemia, or inability to tolerate anesthesia. Goals of cleft lip repair are aesthetic and functional, including restoration of aesthetic facial balance, dentition, and feeding (**See video, Supplemental Digital Content 1**, which describes the preoperative management of the unilateral cleft lip. Indications, contraindications, timing of surgery, and required instruments are discussed. This video is available in the "related videos" section of the full-text article on PRSGlobalOpen.com or available at ***http://links.lww.com/PRSGO/A298***). Presurgical management to improve the nasal shape and align the alveolar arches can be performed passively with nasoalveolar molding or actively using a Latham device.[1,2]

Instrument List and Preparation

Instruments required include loupe magnification, calipers, 15C blades, tenotomy scissors, skin hooks, retractors, adson forceps, Frazier tip suction, and suture material; nasal pledgets and/or conformers are used as needed (**See video, Supplemental Digital Content 1**, which describes the preoperative management of the unilateral cleft lip. Indications, contraindications, timing of surgery, and required instruments are discussed. This video is available in the "related videos" section of the full-text article on PRSGlobalOpen.com or available at ***http://links.lww.com/PRSGO/A298***). The child is placed with neck hyperextension using a shoulder roll. The patient is then prepped and draped in a sterile fashion (**See video, Supplemental Digital Content 2**, which describes key steps, including the markings, of the surgical repair of the unilateral cleft lip. The surgeon's technique features a modified Millard rotation-advancement technique for lip repair and a modified Noordhoff cleft rhinoplasty. This video is available in the "related videos" section of the full-text article on PRSGlobalOpen.com or available at ***http://links.lww.com/PRSGO/A299***).

Procedure Outline

Many techniques exist to repair the unilateral cleft lip and manage the primary palate.[3] The following is the senior author's description and video narration of the widely popular modified Millard rotation-advancement technique for lip repair and a modified Noordhoff cleft rhinoplasty.

After appropriate induction and maintenance of anesthesia, prepping and sterile draping, the procedure commences with marking of the A, B, and C flaps under loupe magnification, which correspond to the rotation, advancement, and columellar flaps, respectively. These marks can be made with methylene blue or simply with a marking pen as per surgeon's preference. The peak of cupid's bow is marked initially on the noncleft side. The distance between this point and the trough is transposed to form the new proposed cleft-side peak. Vertical lip height is ensured by transposing the distance from cupid's peak to the alar base from the noncleft side to the cleft side. The A, B, and C flaps are then marked as the medial (M) and lateral (L) vermilion flaps. However, in the incomplete cleft lip, these M and L flaps are often discarded (**See video, Supplemental Digital Content 2**, which describes key steps, including the markings, of the surgical repair of the unilateral cleft lip. The surgeon's technique features a modified Millard rotation-advancement technique for lip repair and a modified Noordhoff cleft rhinoplasty. This video is available in the "related videos" section of the full-text article on PRSGlobalOpen.com or available at ***http://links.lww.com/PRSGO/A299***).

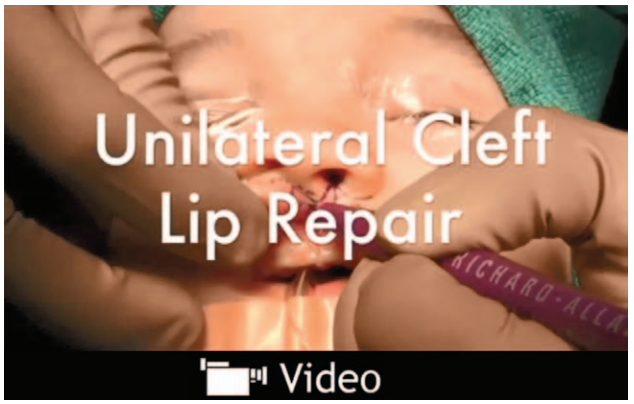
All flaps are scored with a 15C blade before local anesthetic infiltration to minimize the distortion of anatomy. The cutaneous flaps are next dissected and elevated at the deep fascial plane, exposing the orbicularis oris muscle. The muscle is dissected off of the cutaneous and buccal sides of the lip for approximately 3 to 4 mm on the medial lip element and 6 to 8 mm on the lateral lip element. The muscle is also dissected from its superior attachment to the alar base (**See video, Supplemental Digital Content 2**, which describes key steps, including the markings, of the surgical repair of the unilateral cleft lip. The surgeon's

*From the *Faculty of Medicine, University of British Columbia, Vancouver, British Columbia, Canada; †Department of Plastic and Cosmetic Surgery, Sir Ganga Ram Hospital, New Delhi, India; and ‡Division of Plastic Surgery, BC Children's Hospital/University of British Columbia, Vancouver, British Columbia, Canada.*

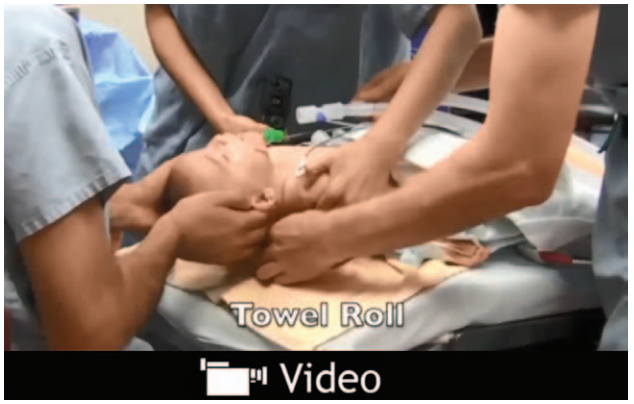
Plast Reconstr Surg Glob Open 2016;4:e1125; doi: 10.1097/GOX.0000000000001125; Published online 23 November 2016.

Disclosure: *The authors have no financial interest to declare in relation to the content of this article. The Article Processing Charge was paid for by the authors.*

Supplemental digital content is available for this article. Clickable URL citations appear in the text.



Video Graphic 1.
Preoperative management. See video, Supplemental Digital Content 1, which describes video describes the preoperative management of the unilateral cleft lip. Indications, contraindications, timing of surgery, and required instruments are discussed. This video is available in the "related videos" section of the full-text article on PRSGlobalOpen.com or available at ***http://links.lww.com/PRSGO/A298***.



Video Graphic 2.
Intraoperative techniques. See video, Supplemental Digital Content 2, which describes key steps, including the markings, of the surgical repair of the unilateral cleft lip. The surgeon's technique features a modified Millard rotation-advancement technique for lip repair and a modified Noordhoff cleft rhinoplasty. This video is available in the "related videos" section of the full-text article on PRSGlobalOpen.com or available at ***http://links.lww.com/PRSGO/A299***.

technique features a modified Millard rotation-advancement technique for lip repair and a modified Noordhoff cleft rhinoplasty. This video is available in the "related videos" section of the full-text article on PRSGlobalOpen.com or available at ***http://links.lww.com/PRSGO/A299***).

A limited closed cleft rhinoplasty is next performed, in which the skin and alar complex is freed off of the cleft-sided lower lateral cartilage. Further mobilization of the lip and alar complex off of the maxilla is achieved with supraperiosteal dissection to allow a tension-free closure and to reposition the alar base to achieve alar base width symmetry. Finally, a Millard gingivoperiosteoplasty is performed in the standard fashion when the alveolar arches are less than 2 mm apart.

It is critical to close the lip in 3 layers, and specific attention to the buccal mucosa is important in an effort to prevent tethering and distortion of the lip and sublabial

Video Graphic 3.
Postoperative management. See video, Supplemental Digital Content 3, which describes the postoperative care of the patient and includes admission, suture removal, follow-up, and potential complications. This video is available in the "related videos" section of the full-text article on PRSGlobalOpen.com or available at ***http://links.lww.com/PRSGO/A300***.

fistula formation. Closure begins with the buccal side of the lip with 5-0 Vicryl interrupted sutures. Importantly, approximation of the orbicularis oris is done with 4-0 Vicryl buried horizontal mattress sutures in a praying hands fashion to evert the muscle and emulate the normal philtral column (**See video, Supplemental Digital Content 2**, which describes key steps, including the markings, of the surgical repair of the unilateral cleft lip. The surgeon's technique features a modified Millard rotation-advancement technique for lip repair and a modified Noordhoff cleft rhinoplasty. This video is available in the "related videos" section of the full-text article on PRSGlobalOpen.com or available at ***http://links.lww.com/PRSGO/A299***).

The cutaneous lip closure begins by interdigitating the cutaneous flaps, with deep closure using a few 5-0 Vicryl sutures. It is important to realign the anatomical landmarks, including the cupid's bow, vermilion border, and alar base as any discrepancy will be obvious. The vermilion is closed with a few 5-0 Vicryl sutures, and the cutaneous lip is closed with 6-0 nylon sutures. Finally, the vestibular nasal web is obliterated, and an alar lift suture is placed using 5-0 Prolene over felt pledgets (**See video, Supplemental Digital Content 2**, which describes key steps, including the markings, of the surgical repair of the unilateral cleft lip. The surgeon's technique features a modified Millard rotation-advancement technique for lip repair, and a modified Noordhoff cleft rhinoplasty. This video is available in the "related videos" section of the full-text article on PRSGlobalOpen.com or available at ***http://links.lww.com/PRSGO/A299***). McComb sutures can also be used to correct the nasal deformity.[4,5] Nasal conformers are used where needed.

Postoperative Care

The patient is often admitted overnight for observation and is discharged when feeding well (**See video, Supplemental Digital Content 3**, which describes the postoperative care of the patient and includes admission, suture removal, follow-up, and potential complications. This video is available in the "related videos" section of the full-text article on

PRSGlobalOpen.com or available at ***http://links.lww.com/PRSGO/A300***).

Polysporin is used to dress the wound. Arm restraints are used for the first 2 weeks, along with a prescription for analgesics and antibiotics. Cutaneous nylon sutures are removed 1 week postoperatively. Taping of the lip follows for 3 weeks and scar massage and sun protection follows thereafter. Long-term follow-up is arranged with the cleft team. Although rare, acute complications include infection and dehiscence; in the long term, lip contracture, asymmetry, abnormal scarring, or fistula formation could result in the need for secondary reconstructive procedures.

Jugpal S. Arneja, MD, MBA, FAAP, FACS, FRCS(C)
Division of Plastic Surgery
British Columbia Children's Hospital
University of British Columbia
K3-131 ACB, 4480 Oak Street
Vancouver, British Columbia, Canada V6H 3V4
E-mail: jugpal.arneja@ubc.ca

ACKNOWLEDGMENTS

A special thanks to Drs. Kelvin Kwan and Freda Wong for their assistance in preparation of the video as part of their Office of Pediatric Surgical Evaluation and Innovation summer studentship.

REFERENCES

1. Vyas RM, Warren SM. Unilateral cleft lip repair. *Clin Plast Surg.* 2014;41:165–177.
2. Sitzman TJ, Girotto JA, Marcus JR. Current surgical practices in cleft care: unilateral cleft lip repair. *Plast Reconstr Surg.* 2008;121:261e–270e.
3. Greives MR, Camison L, Losee JE. Evidence-based medicine: unilateral cleft lip and nose repair. *Plast Reconstr Surg.* 2014;134:1372–1380.
4. Wolfe SA. A pastiche for the cleft lip nose. *Plast Reconstr Surg.* 2004;114:1–9.
5. McComb H. Primary repair of the bilateral cleft lip nose: a 15-year review and a new treatment plan. *Plast Reconstr Surg.* 1990;86:882–889; discussion 890–893.