the treatment in moderate and mild injuries. Also, ultrasound examination of larynx is useful in the evaluation of laryngeal structures such as vocal cord mobility, cervical cartilages, and soft tissue of the neck in pediatric patients.[10]

Schaefer has grouped the optimal treatment according to the clinical findings.[11]

Group 1: Minor endolaryngeal hematoma and laceration is present. There is no injury in the laryngeal skeleton. CT is used for the detection of laryngeal structure integrity. Patients are followed up closely with 24-hour bedrest and cold steam treatment. Steroids may be recommended.

Group 2: In addition to edema, hematoma, and minor mucosal injury, partial exposition of the cartilage may be mentioned. Airway is maintained by tracheotomy opened under local anesthesia; degree of the trauma is defined by laryngoscopy and esophagoscopy. Spontaneous resolution of the trauma is expected in this group and no surgical intervention is made.

Group 3: In addition to massive edema, wide mucosal lacerations, cartilage exposition, and dislocated and angulated fractures, vocal cord immobilization is also observed. Midline thyrotomy following tracheotomy and endoscopy or laryngeal exploration by laryngofissure in paramedian fractures are performed.

Group 4: Anterior part of the larynx is completely damaged and the integrity of cartilage skeleton is disturbed. To prevent adhesions and sliding of cartilage fragments to the lumen or on each other in anterior larynx, stents ensuring the continuity of the lumen must be used.

In very severe penetrating laryngeal injuries, laryngectomy can be performed after evaluation of all the options. Harrison has reported 3 cases requiring laryngectomy in the case series of gunshot wounds.[12] Delay in diagnosis and treatment may result in complications in these kinds of injuries. Secondary healing may cause formation of granulation tissue and the scar tissue leads to irreversible laryngeal and subglottic stenosis. Glottic web formation, and laryngeal and subglottic stenosis disturb phonation and may lead to permanent tracheotomy. The results are satisfactory if the repair of laryngeal trauma can be handled in the first 24 hours. If unwanted delays occur, steroids and antibiotics must be given to reduce granulation formation and the inflammatory response.

The treatment of recurrent laryngeal nerve (RLN) injury is controversial.[13] If there is a complete vocal cord palsy, exploration is recommended.[13] However, if there is an anatomically intact nerve, this type of paralysis often regresses with the reduction in nerve edema.[13] Greater auricular or sural nerve should be considered for repairing RLN.[13] If the paralysis takes 6 months or longer, injection medialization laryngoplasty, thyroplasty, or nerve transfer may show result.[14] If there is dislocating fracture in cricoid, RLN entrapment may be present. Careful removal of the fragments may help in healing. Bilateral vocal cord paralysis is more commonly seen in the laryngotracheal disjunction.

Incidence of external laryngeal trauma in children is less than in adults. There are several reasons for this. The risk of damage in immature larynx is lower; laryngeal rings in children are very flexible because there is no calcification. Laryngeal ligaments allow the larynx to move during trauma because of being loose. Response of children to laryngeal trauma is different from the adults because the size, shape, position, and the histology of pediatric larynx differ. Narrow laryngotracheal air passage and limited pulmonary reserve increase the severity of functional problems. Loose binding of submucosal structures to the perichondrium in the pediatric endolarynx facilitates the formation of soft tissue damage after trauma, and a severe hematoma and massive edema develop.

CONCLUSIONS

Laryngeal trauma is a rare but fatal condition. In the approach to emergency trauma of larynx, detailed laryngoscopy is important. CT is quite important for the determination of correct diagnosis and the appropriate treatment. Early diagnosis and appropriate treatment are valuable in the ease of breathing and in the protection of voice quality.

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"Three-Suture Technique" for Estimation of the Intraoperative Maneuvers in Rhinoplasty

Karaca Basaran, MD, Ozgur Pilanci, MD, Idris Ersin, MD

Abstract: Rhinoplasty is one of the most challenging procedures to master in plastic surgery. A successful outcome almost always requires a detailed preoperative analysis. However, intraoperative assessment should not be underestimated as well. To give a rough idea about the changing positions of the basic landmarks of the nose, we

From the Department of Plastic and Reconstructive Surgery, Bagcilar Research and Training Hospital, Istanbul, Turkey.
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Address correspondence and reprint requests to Karaca Basaran, MD, Oztopuz cad. Camli konak, Ulus-Besiktas, Istanbul, Turkey; E-mail: basarankaraca@gmail.com
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would like to demonstrate the "3-point suture determination" test. With this simple method, surgeons might estimate the instant effects of certain maneuvers during surgery.

Key Words: Rhinoplasty, analysis, landmark

Rhinoplasty is one of the most difficult procedures in plastic surgery. To achieve satisfactory results, preoperative nasal analysis and planning must be performed in detail. In the literature, many studies about the assessment and analysis of a patient undergoing rhinoplasty have been published. However, most of them have focused on envisioning the surgical outcome on the basis of the preoperative analyses. These include sophisticated photographic studies, sketching, and computer imaging, and the like.[1] However, without a doubt, an intraoperative analysis is as important as a preoperative evaluation. To emphasize this, we would like to demonstrate a very simple and useful method for visualizing the effects of intraoperative maneuvers during rhinoplasty.

TECHNIQUE

This method actually relies on assessing preoperative and immediate postoperative positions of the aesthetic units such as the radix, septal angle, alar bases, or tip defining points in relation to stable landmarks of the face. Three stable points are chosen on the face, which may include the lateral canthi, philtrum, or oral commissures. Even any point on the face, for example, a constant point on the forehead, may be selected. A small dot is marked on the selected reference point. The end of a suture material (2/0 silk, in our case) is held with a clamp and fixed to the previously chosen 3 anatomic landmarks. In the demonstrated case, these landmarks include the lateral canthi, the lowest part of Cupid's bow, and the mid forehead (Fig. 1). Before a certain step is undertaken, the subunit of a nose is selected, which might include the radix, tip defining point, or even the septal angle, after a skin flap elevation. The exact position of a particular subunit in space is determined with a clamp intersecting the 3 different sutures originating from 3 stable facial landmarks. The clamped sutures are cut and preserved on the table to compare new positions of aesthetic units after basic steps such as hump resections, osteotomies, tip defining sutures, grafting, and alar base resections (Fig. 2). At the end of a maneuver, the same process is repeated once again to locate new positions of nasal aesthetic units. Therefore, a comparison is made between the preoperative and immediate intraoperative positions.

DISCUSSION

Rhinoplasty mandates a detailed preoperative analysis for a successful outcome. Surgeons commonly use preoperative photographs and use computer softwares to obtain an aesthetically pleasing result. However, intraoperative analysis is as important as a preoperative one without a doubt. For this purpose, most of the surgeons have been using charts or worksheets in terms of intraoperative analysis. For example, Gunter[2] commonly uses a worksheet where he documents the basic steps both numerically and graphically on a diagram. He considered this system as very effective for the surgeon and as an aid in teaching purposes. This technique can be regarded as a valuable tool for a graphic record of intraoperative maneuvers, actually.

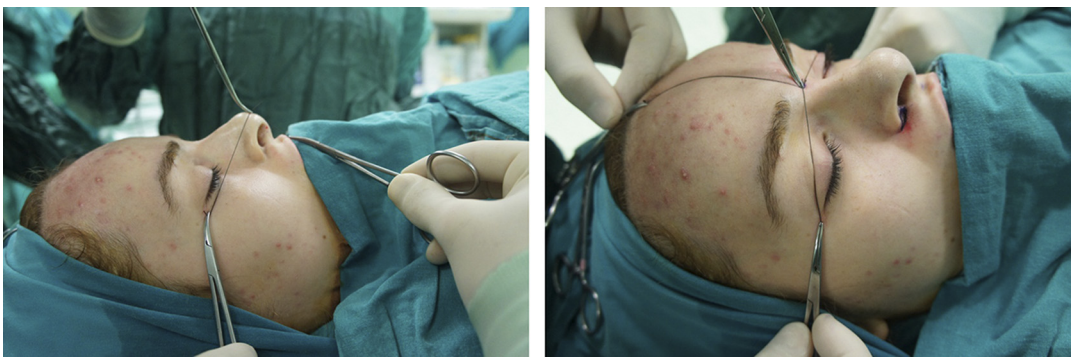

FIGURE 1. Left, Two canthi and the lowest part of the Cupid's bow are selected as stationary reference points. The tip defining point is marked corresponding to the intersection of sutures. Right, The same technique is applied to the 2 canthi and a marked point on the mid forehead.

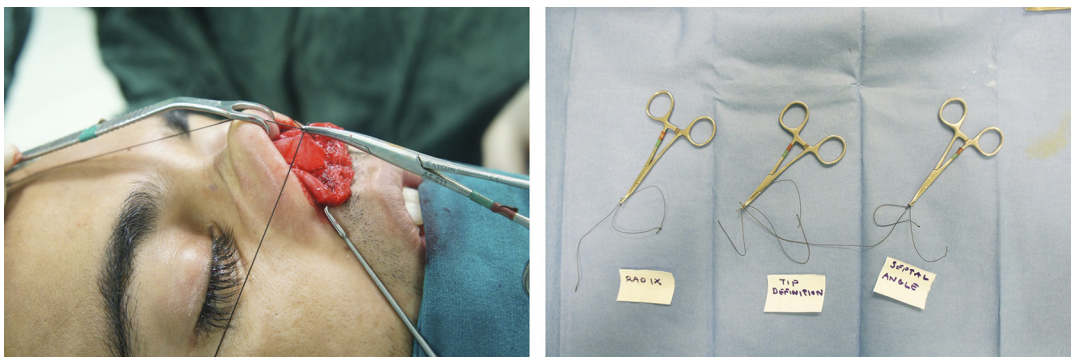

FIGURE 2. Left, The coordinates can be determined even after a skin dissection. In this case, the desired location of the septal height and angle was adjusted according to the previously applied test. Right, The technique can be duplicated for other landmarks such as the radix, septum, and alar bases.

In addition, Guyuron[3] uses full-scale life-size photographs together with soft-tissue analysis to plan intraoperative maneuvers. A template is prepared together with the detailed numerical analysis of life-size photographs. With the help of the template, required surgical steps are planned and compared with the ideal aesthetic proportions. The technique described by Guyuron,[3] without a doubt, brings many advantages to the surgeon. Guided by the ideal proportions and soft tissue cephalometric angles, the nasal bridge, nasal tip, contour, and the chin could be managed independently.

However, most of these methods lack in documenting the instant intraoperative changes after certain rhinoplasty maneuvers. Surgeons commonly take the postoperative photographs of patient and compare them with the preoperative ones. Using this way, they try to evaluate the effects of their moves through comparison of the photographs. However, in the simple technique we described, surgeons can at least get a rough idea about the changes made during the surgery. The 3-point determination test can be repeated frequently during the operation. The key anatomic landmarks such as the radix, tip defining point, or alar bases can be compared with the original coordinates determined in the beginning of the procedure.

In summary, with the method we demonstrated, surgeons can get an immediate data about intraoperative positions of the nasal aesthetic units. The technique is easy, cheap, fast, and readily available. Although it may not replace the more sophisticated analyses, we think that the "3-suture technique" might be a valuable adjunct to the aforementioned methods in rhinoplasty.

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Reduction Cranioplasty for Macrocephaly Caused by Giant Occipital Cystic Lesion

Nobuyuki Mitsukawa, MD, Shoko Shimokawa, MD,† Atsuomi Saiga, MD,‡ Kaneshige Satoh, MD**

Abstract: Reduction cranioplasty for macrocephaly improves patients' quality of life both functionally and aesthetically. However, it is indicated for only a small number of patients because of the risks of complications. Thus, it is rarely performed, and not many reports have been published. In Dandy-Walker syndrome, there is often a posterior fossa cyst continuous with the fourth ventricle. We report here a case of scaphocephalic macrocephaly because of such a cystic lesion. The patient underwent a single-stage surgery with plication of the cyst wall and posterior reduction cranioplasty. This procedure achieved good results.

Key Words: Reduction cranioplasty, macrocephaly, giant occipital cyst, Dandy-Walker syndrome

Surgery for macrocephaly poses a risk for complications. Therefore, it is indicated for only a small number of patients. In addition, different patients have different problems that need to be resolved. The subject in this report had Dandy-Walker syndrome with a giant occipital cystic lesion, causing severe scaphocephalic macrocephaly. Thus, posterior reduction cranioplasty was performed, and good results were obtained.

CLINICAL REPORT

The patient was a 5-year-old girl who was delivered by cesarean section with a birth weight of 3472 g. Since birth, she had cranium bifidum and a scaphocephalic deformity with a markedly long anteroposterior diameter of the head. Head computed tomography (CT) and magnetic resonance imaging (MRI) showed a cerebellar vermian defect, hydrocephalus, and giant occipital cystic lesion. Thus, the patient was diagnosed with Dandy-Walker syndrome.

The patient had other congenital anomalies such as polydactyly, strabismus, and ptosis. When the patient was a few months old, neurosurgeons performed a radical surgery for cranium bifidum and placed a ventriculoperitoneal shunt for hydrocephalus. The developmental quotient was 8 at the age of 4 years, indicating a severe developmental delay. However, physical development was normal. The patient was unable to sleep in a supine position because of the severe scaphocephalic deformity and sometimes developed skin ulcers because of the weight of the head. Thus, she was referred to our department to improve these conditions. The initial examination revealed a severe dolichocephalic deformity with an anteroposterior diameter of 24 cm and a transverse diameter of 14 cm (Fig. 1A). Preoperative three-dimensional CT imaging revealed a scaphocephalic deformity with a tendency for premature fusion of the sagittal suture and coronal suture. Thinning of the bone was observed from the posterior fontanel to the lambdoid suture, and a bone defect was observed in 1 area (Fig. 1B). Preoperative MRI revealed a giant occipital cyst. There were multiple fibrous septal structures in the cyst, which appeared to have no continuity with the fourth ventricle. The cyst displaced and flattened the cerebellum and pons, and the corpus callosum was hypoplastic (Fig. 1C).

Based on the above findings, the patient was diagnosed with severe scaphocephalic macrocephaly due to a giant occipital cystic lesion of Dandy-Walker syndrome. Because the brain parenchyma was distributed more toward the anterior, it was determined that reduction in cyst size would not have much effect on the brain parenchyma. Thus, posterior reduction cranioplasty was planned for functional and aesthetic improvement. Surgery was performed with the patient in a prone position and under general anesthesia. Circumferential osteotomy was performed in the protruded bone section in the occipital region, and the bone was removed. When the dura mater was incised over the cyst, a small amount of serous fluid was observed, but the cyst was mostly hollow. The cyst was isolated from the ventricles by fibrous septa. The fluid that had accumulated

From the *Department of Plastic, Reconstructive and Aesthetic Surgery, Chiba University, Faculty of Medicine, Chiba; and Departments of †Neurosurgery and ‡Plastic and Reconstructive Surgery, St Mary's Hospital, Fukuoka, Japan.

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Address correspondence and reprint requests to Nobuyuki Mitsukawa, MD, Department of Plastic, Reconstructive and Aesthetic Surgery, Chiba University, Faculty of Medicine, 1-8-1, Inohana, Chuo-ku, Chiba City, Chiba, 260-8670 Japan; E-mail: nmitsu@air.linkclub.or.jp

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