ASIAN RHINOPLASTY

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Asian Rhinoplasty

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Introduction

The goal of rhinoplasty for Asian faces is to build a natural-looking and attractive Asian nose that blends harmoniously with the ethnic face (Figs. 1a–d). An attractive Caucasian nose, though maybe beautiful as a nose itself, does not harmonize with the Asian face.

The types of rhinoplasty used in Asians to achieve this goal are very diverse and differ according to individual variations of the nose. However, almost every procedure of Asian rhinoplasty includes some form of augmentation whether it is on the dorsum or on the tip. This stems from the ethnic characteristics of the Asian nose in that it has a relatively flat dorsum and a poorly projected tip. Therefore, commonly applied techniques of rhinoplasty in Asians are different from those used for Caucasians, which are focused on the reduction or refinement.

In this booklet, the characteristics and techniques of Asian rhinoplasty will be briefly highlighted. These include augmentation rhinoplasty, which is the most common procedure, hump nose removal, correction of a deviated nose, tip surgery, alar base reduction, and implant-related problems. All these rhinoplasty procedures have points somewhat different from those of Caucasian rhinoplasty and these differences are not easily recognized without continuous exposure to the Asian rhinoplasty procedure and sustained efforts to compare the differences between the two practices of rhinoplasty.
Anatomic Considerations

Although there are individual variations, the Asian nose is characterized by thick skin with abundant subcutaneous fibro-fatty tissue, weak cartilaginous structures, and short nasal bone width (Fig. 2).1-4 This thick skin better tolerates and blends with the underlying alloplastic or autogenous augmentation material. Delicate and weak lower lateral cartilages together with thin, weak septal cartilaginous support generally require reinforcement by autogenous cartilage in order to obtain a desirable tip shape. Cephalic resection or pure cartilage reshaping sutures often do not work; instead, struts, grafts, and battens are needed to effectively modify the shape of the tip.

Because the harvested septal or conchal cartilage is not enough when compared to the amount of augmentation required, the primary source of augmentation material tends to include alloplastic materials.5 The shorter nasal bone width with flatter nasal pyramid makes the osteotomy more difficult because the path tends to follow the thicker part of the ascending process of maxilla.6 In dorsal reductions, there is a higher chance for middle vault collapse, causing an inverted “V” deformity due to short nasal bone width and length.7 Due to the wide nasal valve angle and thick skin envelope, nasal obstruction due to the internal nasal valve problems is relatively rare in Asians.8

The anatomy of a typical Asian nose. Note the weak cartilages, short nasal bones and the thick skin.
Aesthetic Considerations

An attractive Asian nose has a slightly lower starting point, which is somewhat below the upper eyelash line (Figs. 1a–d). A high nasal starting point matches the 3-D features of a Caucasian face but does not complement the relatively flat Asian face. A straight line drawn from this point to the supratip area determines the appropriate length for the nasal implant. Because the dorsum is flat and wide in many Asians, it needs augmentation or lateral osteotomy in order to narrow the bony nasal pyramid (Figs. 3a, b). For the tip surgery, projection, rotation and volume are the three major factors to consider. These three factors interact with each other to create an ideal tip shape. Many Asians prefer a rather round tip shape instead of the angulated tip with clear definition. A retruded premaxilla, as evidenced by the retruded columnellar base and an acute nasolabial angle, is another characteristic of the Asian nose. A high degree of deficiency in the premaxillary region may require a plumping graft. Many Asians have a wide alar base or increased alar flare. In Northeast Asians, including Koreans and Japanese, alar flare is not frequent while Southeast Asians (Filipinos, Malay) tend to have both a wide alar base and alar flare. Modification of the alar base to correct these problems is another point to consider.

Commonly used techniques in Asian rhinoplasty (a, b).
Augmentation Rhinoplasty

Concept
Previously, the surgeon addressed the tip and dorsum together with an L-shaped silicone implant (Figs. 4a, b). Recent trends in Asian rhinoplasty involve using alloplasts for dorsal augmentation only and autologous tissue tip-plasty to maximize the probability of a favorable outcome and to avoid extrusion or infection of the implant at the tip.

The surgical approach for augmentation rhinoplasty is decided through various factors. The need for major tip change with dorsal augmentation often requires an open approach. Patients who have firm nasal tip support may require nothing more than suture placement for tip reshaping or a graft isolated to the nasal tip similar to a Caucasian rhinoplasty. In this case, an intercartilaginous incision is preferred for the dorsal augmentation and a separate marginal incision for the tip surgery. More typically, a weak lower lateral cartilage with deficient caudal septal cartilage requires structuring cartilaginous support graft for the tip. In this case, both the dorsum and tip are addressed through bilateral marginal incisions or by utilizing an open rhinoplasty approach.

Choice of Augmentation Material
There are numerous factors to consider before deciding which augmentation material to use. The amount of augmentation needed, the skin thickness, the patient’s wishes and age and available cartilaginous structures are important factors to examine. It is best, if the desired result can be achieved using autogenous materials. When alloplastic material is considered, the benefits and risks should be explained to the patient before the surgery.

Inspection and palpation of the nasal septum and auricular concha to verify availability and suitability of the cartilage helps in material selection. In a patient who has a minor or partial deficiency of the dorsum along with a thick and large septal cartilage, dorsal augmentation is achieved through single or multiple layers of septal cartilage (Fig. 5a). Conchal cartilage is also a useful material for augmentation and is often combined with septal cartilage to create multiple layers (Fig. 5b). Rib cartilage affords enough volume to augment major deficiency of the dorsum (Fig. 5c).

Various shapes and sizes of Silicone implants are commercially available (Fig. 4a). The anticipated length and thickness of the implant used to achieve appropriate augmentation is measured. Based on the specified dimensions, adequately sized grafts are tailored prior to surgery. Gore-Tex*-reinforced implants may be used in the form of sheets or prefabricated blocks similar to Silicone implants (Fig. 4b).
Dorsal Implant Augmentation

Before the injection, mark the cephalic edge of the implant or graft pocket, which usually is slightly higher than the interpupillary line. Next, outline the pocket, where the implant will sit (Fig. 6). The prefabricated Silicone or Gore-Tex® implants can be shaped with a Number 15-blade preoperatively and then sterilized for insertion, or it can be shaped intraoperatively. If tip augmentation is planned, the position of the tip graft is determined and marked on the skin, carefully considering the final projection and rotation of the tip. The approach to the dorsum and the tip depend on the procedures needed for the tip surgery. In the case of a simple onlay or shield graft for the tip, a separate intercartilaginous incision for the dorsal augmentation and a marginal incision with or without extension to the medial crura for the tip, are desirable. If more comprehensive procedures such as interdomal sutures, septal extension grafts, or columellar strut are necessary for the tip surgery, the dorsum

Before injection of local anesthetics, the cephalic margin of the implant with the anticipated boundaries of the graft pocket is marked on the nasal dorsum.

Pre- (a, b) and postoperative views (c, d) of a patient who had augmentation rhinoplasty with L-shaped silicone implant. Nasal tip augmentation was done with autogenous cartilages using an open approach.
Asian Rhinoplasty

is augmented through the same marginal incision, that is usually extended along the medial crura. In the former case, an intercartilaginous incision is made and extended into a partial transfixion incision along the upper caudal end of the septal cartilage. Find a supraperichondrial plane over the upper lateral cartilage and elevate the skin-soft tissue envelope, exposing the nasal pyramid. Incise the periosteum and elevate the periosteum to the anticipated level of the new nasion. Make a pocket where the implant can fit snugly. Careful and symmetric dissection over the dorsum prevents malposition of the implant (Figs. 7a–d). For beginners, bilateral intercartilaginous incisions and dissection are recommended to prevent unilateral displacement of the implant. Next, insert the nasal implant into the pocket and adjust as necessary. Prior to insertion, make sure that manipulation of the implant be kept to a minimum, and that the recipient pouch be irrigated with an antibiotic solution. Incisions are closed with 5-0 Vicryl suture material.

Dorsal Augmentation using Autogenous Material

The same incisions and approaches used for implant augmentation are applied for autogenous cartilage. Septal or conchal cartilages are harvested prior to dorsal dissection. The septum is harvested through a separate hemitransfixion incision made 2 mm anterior to the caudal septum. The septum is exposed via a dorsal approach after extramucosal dissection over the cartilaginous and bony vault when there is a need for spreader grafts with an open approach. The septum is harvested, leaving at least 10 mm of cartilage dorsally and caudally (Fig. 8). Extreme care should be taken not to disrupt the keystone area or the connection between the anterior nasal spine and the posterior septal angle. Subsequently, the incision is closed with septal mattress sutures utilizing a 5–0 chromic gut. The conchal cartilages are harvested by either an anterior or a posterior approach. Leaving a strip of cartilage between the cavum concha and triangular fossa helps maintain the shape of the auricle. Rib cartilage is harvested from the 6–8th rib through a 3–4 cm skin incision. The incision is performed at the infra-mammary crease in women to maximally camouflage the incision scar (Figs. 9a, b).
Retracting, not incising the external oblique muscle and tightly closing the muscles after harvesting the cartilage help to relieve the pain after surgery. Immersion of the cartilage in warm saline for thirty minutes post harvest with symmetric carving helps to minimize warping. A strip of perichondrium from the cartilage is useful for future use. Dorsal augmentation using rib cartilage is very useful in treating a major dorsal deficiency caused by trauma (Figs. 10a–d).

Frequently, double or triple layers of septal and conchal cartilage are stacked and sutured together in order to obtain a desirable height (Figs. 11a–d). Careful carving of the edges of the grafts is needed for smooth transition from dorsum to sidewall. Special attention is paid to the nasion end of the graft so that it blends smoothly without any step formation. The grafts are fixed temporarily with two 25 G-needles by picking the grafts and underlying cartilages from the dorsal skin while suturing all incisions (Fig. 12). All incisions are closed primarily with 5–0 Vicryl. Steri-strips™ and Aquaplast are applied.
Pre- (a, b) and postoperative views (c, d) of a man who underwent dorsal augmentation using stacked conchal and septal cartilages.

Temporary fixation of the dorsal graft with two 25G needles.
Pre- (a) and postoperative lateral views (b) of a man who underwent nasal hump resection.

Hump Reduction

Concept

The goal of nasal hump removal in Asians is to obtain a natural contouring of the nasal dorsum that is in harmony with the nasal tip through simultaneous dorsal reduction and augmentation. Although there are patients who have large humps (Figs. 13a, b), most Asian hump nose issues differ from their Western counterparts in that the size of the nasal hump is not large and is frequently associated with a relatively low nasal dorsum with under-projection or under-rotation of the nasal tip (Figs. 14a–g).7,8
Pre- (a, b, c) and postoperative views (d, e, f) of a woman who had hump resection, dorsal augmentation and tip surgery. Resection of the hump was minimized considering the accompanying augmentation of the dorsum and the tip (g).

*PEP – Perpendicular Ethmoid Plate
Therefore, correcting a hump nose in Asians may have distinct differences in both concept and techniques that stem from the anatomic and aesthetic differences of the Asian nose when compared with the Caucasian nose. First, a relatively small hump size and additional need for augmentation of the dorsum and the tip often minimize the amount of hump removal or sometimes obviate the need for resection itself (Fig. 15).

This procedure is technically more difficult and trickier than resecting a large hump. Second, complications caused by overzealous hump removal are rarely found due to the small amount of hump removal and accompanying cartilage graft. However, due to the short nasal bone width and length in Asians, a spreader or camouflage graft is necessary after resection of a moderate or large-sized hump in order to prevent middle vault collapse.

**Technique**

An endonasal approach is preferred; however, an open approach is selected for patients having concomitant deviation of the cartilaginous dorsum, complex nasal deformities, and when complementary procedures including augmentation of the dorsum and major tip change are needed in addition to hump removal.

For the endonasal approach, a unilateral or bilateral intercartilaginous incision combined with partial transfixion or hemitransfixion incision is used. Regardless of the approach, the anterior septal angle and the entire nasal dorsum are visualized after the supraperichondrial and subperiosteal dissection. The characteristics of the nasal hump are evaluated with careful visualization as well as palpation.

Before dorsal reduction, an ideal tip contour or position should be defined and kept in mind. A Number 15 blade is held at the bony-cartilaginous junction of the dorsum in the horizontal plane and advanced caudally in the plane of reduction to excise the cartilaginous portion of the hump and transect the upper laterals along with the cartilaginous septum, taking care that any residual attachments to the nasal bones are left intact (Fig. 16a). A 10 mm-Rubin osteotome is then inserted under the cartilaginous segment and the bony dorsum is reduced in the desired plane, removing the entire osseocartilaginous hump “en-bloc” (Fig. 16b). Judicious rasping and cartilage trimming is performed with careful and repeated palpation of the dorsum. In cases of a small hump, bony rasping with trimming of cartilage is enough to obtain the desired hump reduction.

Medial or lateral osteotomy is performed either endonasally or percutaneously in patients who have an open roof deformity, a wide dorsum or an associated nasal deviation. A spreader graft is positioned either unilaterally or bilaterally in patients who need correction of cartilaginous deviation or prevention of the inverted “V” deformity (Fig. 17).
Hump resection resulted in separation of the upper lateral cartilage and the dorsal septum. The incidence of an inverted “V” deformity can be reduced to a minimum by the placement of spreader grafts.

Demonstration of an endonasal hump resection technique in a cadaver (a, b). The same technique is applied in an open approach (c, d).
Onlay grafts are used to achieve the desired height of the dorsum or to camouflage any remaining irregularities. Tip surgery is performed at the end of the procedure in order to achieve a harmonious nose (Figs. 18a, b). Techniques used for tip surgery include shield or cap grafts, columellar struts, cephalic resection, interdomal suture and septal extension grafts. All grafts are fashioned using autologous tissue.

Correction of a Deviated Nose

Concept

Correction of a deviated nose remains one of the most challenging rhinoplastic procedures. The difficulties are linked to the complex nature of the underlying anatomic deformity contributing to the deviation and give birth to various surgical algorithms using either an endonasal or external approach and the combination of many surgical techniques.

In spite of various surgical algorithms and techniques, the basic principles of surgical strategy do not change and include structural realignment with release of deforming forces, preservation or reconstruction of the key skeletal support, and correction of functional problems while establishing the desired nasal aesthetics. These strategies should be individualized to address the wide anatomic variations between patients. The strategies include many critical techniques, among which, five key maneuvers are highly effective and relevant for correcting a specific anatomic abnormality that contributes to the deviation:

- septum straightening,
- complete osteotomy,
- spreader grafts for surgical repair of cartilaginous dorsal deviation,
- turbinate hypertrophy management, and
- adequate camouflage.\textsuperscript{17}

These maneuvers can be applied universally to correct a deviated nose in any race, but need some modifications for effective application due to the anatomic and aesthetic differences of the Asian nose compared to the Caucasian nose.\textsuperscript{17}
Technique
When there is a pronounced septal deviation contributing to the nasal deviation, I usually begin with a septoplasty first. The endonasal approach is selected when only the bony nasal vault is deviated with no curvature of the cartilaginous dorsum, or when the cartilaginous dorsum is mildly curved, associated with an underlying septal deviation. An open approach is preferred for correction of severe deviation of the cartilaginous dorsum, complex nasal deformities associated with the deviation, and when complementary procedures including augmentation of the dorsum with major tip change are needed in addition to correcting the deviation. After extramucosal dissection over the entire cartilaginous and bony septum (Fig. 19), the deviated septal portion is excised, leaving 10 mm of cartilage dorsally and caudally, and the tissue is banked for future use. If the caudal septum is dislocated, it is repositioned and fixed to the midline with suture. Deviation of the cartilaginous dorsum necessitates separation of the septal cartilage from the upper lateral cartilage, and either unilateral or bilateral placement of a spreader graft (Figs. 20a, b).

The whole septum is exposed through a dorsal approach by dissecting out the mucoperichondrium bilaterally.

Correction of a deviated cartilaginous septum by bilateral placement of spreader grafts (a).

Pre- (b1) and postoperative (b2) frontal views showing the straightened lower 2/3 of the nose (b).
After straightening the septum and the cartilaginous dorsum, the bony pyramid is addressed. Complete medial and lateral osteotomies are performed either endonasally or percutaneously to move the pyramid into the midline (Figs. 21a, b). Camouflage grafts are used when there are remaining concavities or convexities after full correction of the deviation. Modification of the tip, hump removal, and augmentation of the dorsum are performed together with correction of the deviation in order to obtain a nose that forms a coherent whole (Figs. 22a–g). Camouflage grafts, tip grafts, and dorsal augmentation are performed with harvested cartilage or bone from the septum, auricle or rib. If the inferior turbinate is hypertrophied, it is reduced gently using an anterior inferior turbinoplasty in which the skeleton and lateral mucosa of the anterior inferior turbinate is removed after submucosal elevation of the medial aspect.
Pre- (a–c) and postoperative views (d–f) of a patient who had a corrective rhinoplasty. Osteotomy, spreader graft and camouflage grafts were used (g).

* PEP = Perpendicular Ethmoid Plate

22g

rasping
onlay graft (crushed cartilage)

spreader graft with vomer
vertical fracture

septum along with PEP* harvested and re-inserted
vomer harvested
Tip Surgery

Concept

Many Asians have a poorly projected tip with weak support and a somewhat amorphous nasal tip with little definition. The weak lower lateral cartilages and the caudal septum along with the relatively thick skin and soft tissues compared to the poorly developed framework contribute to this phenomenon.

For the tip surgery in Asians, projection, rotation and volume are the three major factors to consider. A harmoniously matched projection of the nasal tip that conforms with the augmented dorsum, a gentle round shape instead of a well-defined, angulated tip and a rotated nasal tip (that is not overly rotated) are the ideals that Asian nasal tip surgery pursues.

Recently, it has been reported, that the level of acceptance toward the uniform augmentation of the nasal dorsum and tip using an L-shaped silicone implant is in decline. Instead, a separate treatment of the nasal tip using autogenous cartilages while employing alloplastic material for dorsal augmentation is the current gold standard in Asian countries. However, there are inherent limitations and technical pitfalls one should look out for, when changing the shape of the nasal tip in Asians. The surgeons must admit the limitations caused by the anatomical characteristics of the Asian nasal tip and make sure that cartilages and soft tissues won’t be exposed to excessive manipulations in an attempt to achieve a dramatic change in tip shape. Structural grafting that minimizes tissue sacrifice upon a firm septal support is a precondition that must be met to achieve a desirable projection and rotation of the tip. Unnatural over-accentuation of the tip projection with resultant cephalic rotation of the nasal tip gives the appearance of a short nose, which is a common pitfall that many Asian rhinoplastic surgeons should avoid.

Technique

Cap or shield grafts made of conchal or septal cartilage can be used very effectively for increasing tip projection in patients who have moderate to firm tip support (Figs. 23a, b and 24a, b). The anticipated site of the grafts dictates the site of incision, limiting the dissection to the target area. The marginal incision for a cap graft usually follows the infradomal region to create a precise recipient pocket (Figs. 25a, b). Graft positioning is facilitated by bilateral incisions. Optionally, the graft can be secured in place by sutures.
Before (a) and immediately after (b) placement of a shield graft for enhancement of tip projection. The rib cartilage for dorsal augmentation is fixed in place with a needle.

Infradomal incision for placement of a shield graft (a, b).
Marginal incisions with extension along the medial crura enable a more precise manipulation of the tip. The skin-soft tissue envelope is dissected, exposing the lower lateral cartilage and the dome. This enables various sutures, grafts and cartilage-modifying techniques to be successfully used for changing the tip shape (Figs. 26a–g). Because many Asians have small lower lateral cartilages, cephalic resection is rarely used, although it has proven to be efficient in narrowing the dome, if employed in a proper candidate. Placement of interdomal sutures only slightly increases tip projection, whereas both intradomal and transdomal sutures increase tip projection and rotate the tip in a cephalic direction.
A long shield graft is very effective in increasing tip projection (Fig. 24). However, if the cartilage is thin, the portion of graft exceeding the dome in height may rotate cephalically, making the nose look short. This can be prevented by a buttress graft placed behind the shield graft or by adjusting the position of the cap graft so that it inhibits rotation while achieving the desired projection (Fig. 27).

A cap graft is placed over the dome through an endonasal approach (a, b, c). The domes are sutured together with the columellar strut prior to graft placement. The postoperative frontal and profile views (e, g) demonstrate the well-augmented tip with better definition compared to the preoperative views (d, f).

A protruding shield graft was reinforced with a cap graft to prevent cephalic rotation. The margins of the graft were carefully carved to eliminate any sharp edges.
If the tip needs a major change, an open approach is preferred. The tip projection and rotation are more effectively modified using grafts, struts, and especially with septal extension grafts (Fig. 28). The placement of a septal extension graft is a very useful technique for changing the shape of the nasal tip in patients who have a weak tip support (Figs. 29a–d).

Pre- (a, c) and postoperative views (b, d) of two patients who had a modification of the nasal tip using septal extension grafts.
**Alar Base Modification**

Alar base modification in Asian noses is focused on two points: correction of an overly wide alar flare and alar base narrowing. Flaring ala is rarely found in Northeast Asians including Koreans and Japanese, although it is common in Southeast Asians including Malay and people from the Philippines. Modest narrowing of the alar base combined with correction of alar flare is desirable to preserve the ethnic identity and to prevent complications caused by over-resection.

To reduce flare, alar wedge resection is performed by excising an elliptical portion of tissue (Fig. 30). The incision follows 1–2 mm above the alar-facial groove in order to help eversion of the margin. The incision is closed with 6-0 fast-absorbing gut after subcutaneous suture with 5-0 PDS. Increasing tip projection often obviates the need for alar base narrowing. Narrowing of the alar base is accomplished by a nostril sill excision or sliding alar flap (Figs. 31, 32). A vertical wedge-shaped excision of the nostril sill measuring 2–4 mm in center width followed by sutures with 6-0 fast-absorbing gut will reduce the alar base width. A combined sill and alar wedge excision will narrow the alar base while reducing the alar flare (Figs. 33, 34). A small flap of tissue is preserved medially at the base of the columella so as not to change the shape of the nostril radically.

Asymmetric nostrils are mostly due to a dislocated caudal septum, except for cleft nose deformity. Repositioning of the caudal septum into the midline usually restores symmetry.
Postoperative Care

After surgery, the nose is taped, loosely packed and splinted. Antibiotics are prescribed for a week. The patient is encouraged to elevate the head and icepacks are applied for a day or two to reduce edema. The nasal packing is removed on the same day as the surgery, usually in the evening. The nasal cavity is cleaned regularly and temporary use of a nasal decongestant is recommended to relieve nasal swelling. The sutures are removed five to seven days after surgery and the external splint is removed after seven days. Trauma to the nasal area should be strictly avoided. Sun exposure should be avoided for at least one month after surgery in order to prevent discoloration. After cast removal, a digital exercise on the nose helps to stabilize the mobilized nasal pyramid.

Complications

Infection can present many months after surgery when an alloplastic implant was used for augmentation (Figs. 35a, b).5,19, 20 Though an aggressive antibiotic therapy sometimes resolves the infection, most often the implant needs to be removed, especially in cases of augmentation with Gore-Tex®.10, 21 Autogenous tissue augmentation should be scheduled no earlier than six months after removal of the failed implant although concomitant augmentation with autogenous tissue is often safe and successful. Injectable silicone can cause a foreign-body reaction presenting as a dorsal cyst formation even twenty years after the surgery (Figs. 36a–c).

Often, the dorsal implant is not in the midline, which can be avoided by careful bilateral and symmetric dissection in preparing the recipient pocket (Figs. 37a–c).
A dorsal cyst was removed from the nasal radix via direct, open approach (a). The defect was augmented using autogenous cartilages immediately after removal of the cyst (b, c).

Frontal view of a patient presenting with a deviated primary silicone graft (a), that required surgical removal (c). A harmonious, balanced appearance could be achieved by creation of a symmetrically positioned recipient pouch and insertion of a new silicone graft (b). Tip augmentation was performed using autogenous cartilage.
Note the skin erosion (a) caused by a primary L-shaped silicone implant that had been oversized as compared to the actual dimensions of the nose (b).

A contracted nose after rhinoplasty with a silicone implant (a, b, c), which was found to be displaced. Revision rhinoplasty was performed using conchal cartilages to augment the nose while lengthening the nose (g). At one year postoperatively, the patient (d, e, f) presented with an improved nasal shape.
Excess tension on the tip area by an L-shaped implant or an oversized implant causes skin thinning of the tip or extrusion of the implant (Figs. 38a, b). The membranous septum or tip skin is the predilection site for graft extrusion. Removal of the graft and reconstruction with autogenous tissue is necessary in order to prevent further deterioration of the skin or contraction of the nasal tip. Contraction of the soft tissue by a silicone graft needs revision by autogenous tissue (Figs. 39a–f). Visible, open rhinoplasty scars can be avoided by careful degloving and meticulous closure of the skin (Figs. 40a, b).

**Conclusion**

Although the main principles of various rhinoplasty techniques apply equally to the Asian nose, some modifications are mandatory due to anatomic and aesthetic differences. Understanding these differences and mastering the techniques unique to the Asian nose while observing the general rules of rhinoplasty will lead to a successful outcome.

Augmentation rhinoplasty is the most common procedure in Asian rhinoplasty. Although autologous cartilages are often used with an excellent result, a careful use of alloplastic implants as primary donor material for dorsal augmentation in selected cases is a widely accepted practice in Asian rhinoplasty, not least because of the relative scarcity of autogenous tissue compared to the amount of augmentation required. The relatively thick skin of the Asian nose better tolerates the dorsal alloplastic implants. Open rhinoplasty is gaining in popularity due to the potential difficulties associated with tip surgery in Asians. Another merit of open rhinoplasty is that it enables a more natural and exact sculpturing of the tip when using autogenous cartilages.
References

Recommended Set for Functional and Aesthetic Rhinoplastic Procedures
Instrument Set for Functional and Aesthetic Septo-Rhinoplasty

496400  MASIING Surgical Handle, length 14 cm, for Blades 208010 – 15, 208210 – 15

208215  Blade, Fig. 15, sterile, package of 100

208211  Same, Fig. 11, sterile, package of 100

208000  Surgical Handle, Fig. 3, length 12.5 cm, for Blades 208010 – 15, 208210 – 15

496500  Surgical Handle, for miniature blades, round, length 15.5 cm, for Blades 496764 – 70

496764  Miniature Blade, Fig. 64, round, sterile, package of 25

468500  BECKER-CAPLAN Septum Scissors, double action jaws, serrated, working length 9.5 cm

499000  MASING Nasal Knife, curved, roundly tipped blade, length 14 cm

493000  COTTLE Nasal Knife, rounded edge, length 14 cm

417013  Cotton Applicator, standard model, triangular, serrated, diameter 1.3 mm, length 15 cm

489091  COTTLE Doral Scissors, angular, with tungsten carbide inserts, heavy, working length 7.5 cm

511010 DS  Scissors, extra delicate, straight, sharp/sharp, length 10.5 cm, color code: one gold-plated handle ring

511210 DS  Scissors, extra delicate, curved, sharp/sharp, length 10.5 cm, color code: one gold-plated handle ring

513410 DS  COTTLE Scissors, curved, length 10.5 cm, color code: one gold-plated handle ring

511141 DS  JOSEPH Scissors, curved, length 14 cm, color code: one gold-plated handle ring

513200  WALTER Scissors, angled, length 10 cm

513700 DS  FOMON Scissors, curved surface, slender, working length 6.5 cm, color code: one gold-plated handle ring

484004  COTTLE Chisel, flat, graduated, straight, width 4 mm, length 18.5 cm

484007  Same, width 7 mm

484009  Same, width 9 mm

484106  Same, curved, width 6 mm

484206  COTTLE Crossbar Osteotome, graduated, double-edged grinding, straight, width 6 mm, length 18.5 cm

484406  COTTLE Crossbar Chisel, graduated, single-edged grinding, curved, width 6 mm, length 18.5 cm

486102  WALTER Osteotome, flat, double-edged grinding, width 2 mm, length 19 cm

486103  Same, width 3 mm

486104  Same, width 4 mm

486107  Same, width 7 mm

487010  RUBIN Osteotome, flat, straight, double-edged grinding, rounded corners, with finger grip stabilizer, width of cut 10 mm, length 16.5 cm

487016  Same, width of cut 16 mm

488060  Ala Double Hook, with octagonal handle, with 2 sharp points, strongly curved, special matt finish, width 2 mm, length 16.5 cm

506400  AUFRIECH Nasal Retractor, width of retractor blade 8 mm, length of retractor blade 40 mm, length 16.5 cm

505700  COTTLE Knife Guide and Retractor, one side with two-pronged nostril retractor, other side with flat retractor, with duct for guide of cut, length 19 cm

505000  COTTLE Retractor, two prongs, sharp prong on left, blunt prong on right, width 10 mm, length 14.5 cm

491001  Hook, one prong, large curve, length 16.5 cm

479800  Suction Raspatory, with stylet, length 19.5 cm

479000  MASING Elevator, double-ended, graduated, sharp and blunt, length 22.5 cm

488074  FREER Elevator, double-ended, sharp and blunt, special matt finish, length 20 cm

478304  McKENTY Raspatory, width 4 mm, length 14.5 cm

478305  Same, width 5 mm

534015  COTTLE Lower Lateral Forceps, bayonet-shaped, with set screw, serrated tips and teeth on the inside, length 15 cm

533022  ADSON Dressing Forceps, serrated, tungsten carbide inserts, length 12 cm

533112  ADSON Tissue Forceps, 1 x 2 teeth, length 12 cm

533212  ADSON-BROWN Tissue Forceps, atraumatic, fine side grasping teeth, length 12 cm

523600  Nasal Rasp, double-ended, fine, length 21.5 cm

523700  Same, coarse (rasp)

523812  Nasal Rasp, tungsten carbide, double-ended, rasp blades Fig. 1 and 2, coarse, length 20.5 cm

503655  COTTLE Metal Mallet, length 18 cm

503275  KILLIAN-STRUYCKEN Nasal Speculum, with set rack, blade length 40 mm, length 15 cm

456003  KILLIAN-STRUYCKEN Nasal Speculum, with set rack, blade length 75 mm, length 15 cm

456001  BLAKESLEY Nasal Forceps, straight, size 1, working length 11 cm

466000  Same, size 3

403240  CRAIG Septum Forceps, straight, working length 9 cm

403275  NEIVERT-ALFORD Needle Holder, thumb ring upturned, one jaw with groove, length 13 cm

456001  CRILE-WOOD Needle Holder, length 15 cm

450001  Needle Holder, extra delicate, slight spring action, length 17 cm

456001  FRAZIER Suction Tube, with mandrel and cut-off hole, with distance marking at 5 – 9 cm, 7 Fr., working length 10 cm

454000  Same, 9 Fr.

454000  COTTLE Columella Clamp, length 11 cm

453913  Metal Tray, for preparing cartilage and bone, with hole for towel forceps, size 10 x 15 cm

523913  Suction Tube, curved, outer diameter 5 mm, length 16.5 cm
Instrument Set for Adjunctive Endoscopic Correction of the Nasal Septum and Lamina perpendicularis

7229 AA  
HOPKINS® Straight Forward Telescope 0°, enlarged view, diameter 2.7 mm, length 18 cm, autoclavable, fiber optic light transmission incorporated, color code: green

7230 AA  
HOPKINS® Straight Forward Telescope 0°, enlarged view, diameter 4 mm, length 18 cm, autoclavable, fiber optic light transmission incorporated, color code: green

426516  
JANSEN Nasal Dressing Forceps, bayonet-shaped, length 16.5 cm

449002  
HEYMANN Nasal Scissors, medium, (standard model), working length 9.5 cm

449003  
Same, large, working length 11 cm

449201  
RHINOFORCE® II Nasal Scissors, straight, with cleaning connector, working length 13 cm

449202  
Same, curved to right

449203  
Same, curved to left

456003  
BLAKESLEY Nasal Forceps, straight, size 3, working length 11 cm

474000  
FREER Elevator, double-ended, semisharp and blunt, length 20 cm

488038  
RUBIN Septum Morcelizer, with double joint, straight, special matt finish, length 20 cm

529305  
FRAZIER Suction Tube, with mandrel and cut-off hole, with distance marking at 5 – 9 cm, 5 Fr., working length 10 cm

629825  
KUHN Frontal Ostium Seeker, no. 6, both sides curved 77°, one tip straight, other tip reverse angle, length 22 cm

208000  
Surgical Handle, Fig. 3, length 12.5 cm, for Blades 208010 – 15, 208210 – 15

748000  
Surgical Handle, Fig. 7, length 16.5 cm, for Blades 208010 – 15, 208210 – 15

208210  
Blade, Fig. 10, sterile, package of 100

Instrument Set for Repositioning Nasal Bone Fractures

525870  
BEHRBOHM-KASCHKE Straightening Elevator for fractures of the nasal bone and zygomatic Arc. Set of 2 right and left, double-ended, length 27 cm

7230 AA  
HOPKINS® Straight Forward Telescope 0°, enlarged view, diameter 4 mm, length 18 cm, autoclavable, fiber optic light transmission incorporated, color code: green

403240  
KILLIAN-STRUYCKEN Nasal Speculum, with set rack, blade length 40 mm, length 15 cm

403265  
Same, blade length 65 mm

426516  
JANSEN Nasal Dressing Forceps, bayonet-shaped, length 16.5 cm

529305  
FRAZIER Suction Tube, with mandrel and cut-off hole, with distance marking at 5 – 9 cm, 5 Fr., working length 10 cm

474000  
FREER Elevator, double-ended, semisharp and blunt, length 20 cm

It is recommended to check the suitability of the product for the intended procedure prior to use.
Headlight KS60
with Cold Light Illumination

310060

310060  Headlight KS60, with double lens system and Y-fiber optic light cable, >175,000 lux, illuminated area adjustable from 20 – 80 mm with 40 cm working distance, including:
310063  Headlight KS60, with removable and sterilizable Focus Handle 310065
310070  Headband, fully adjustable, with Forehead Cushion 078511, with cross band, including holder for Headlight 310063
495 NY  Y-Fiber Optic Light Cable, with special protective casing for Headlight 310063, length 290 cm
078681  Clip with Band, for attaching the fiber optic light cable to OR clothing

HOPKINS® Telescope – autoclavable
Diameter 2.7 mm, length 18 cm

7229 AA–FA

7229 AA  HOPKINS® Straight Forward Telescope 0°, enlarged view, diameter 2.7 mm, length 18 cm, autoclavable, fiber optic light transmission incorporated, color code: green

7229 BA  HOPKINS® Forward-Oblique Telescope 30°, enlarged view, diameter 2.7 mm, length 18 cm, autoclavable, fiber optic light transmission incorporated, color code: red

7229 FA  HOPKINS® Forward-Oblique Telescope 45°, enlarged view, diameter 2.7 mm, length 18 cm, autoclavable, fiber optic light transmission incorporated, color code: black

7229 CA  HOPKINS® Lateral Telescope 70°, enlarged view, diameter 2.7 mm, length 18 cm, autoclavable, fiber optic light transmission incorporated, color code: yellow
HOPKINS® Telescopes – autoclavable
Diameter 4 mm, length 18 cm

- **7230 AA**
  - HOPKINS® Straight Forward Telescope 0°,
  - enlarged view, diameter 4 mm, length 18 cm, **autoclavable**, fiber optic light transmission incorporated, color code: green

- **7230 BA**
  - HOPKINS® Forward-Oblique Telescope 30°,
  - enlarged view, diameter 4 mm, length 18 cm, **autoclavable**, fiber optic light transmission incorporated, color code: red

- **7230 FA**
  - HOPKINS® Forward-Oblique Telescope 45°,
  - enlarged view, diameter 4 mm, length 18 cm, **autoclavable**, fiber optic light transmission incorporated, color code: black

- **7230 CA**
  - HOPKINS® Lateral Telescope 70°,
  - enlarged view, diameter 4 mm, length 18 cm **autoclavable**, fiber optic light transmission incorporated, color code: yellow

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**Accessories**
for use with HOPKINS® Telescopes

- **723770**
  - STAMMBERGER Telescope Handle,
  - flat, standard model, length 11 cm, for use with HOPKINS® straight forward telescopes 0° with diameter 4 mm and length 18 cm

- **723772**
  - STAMMBERGER Telescope Handle,
  - round, standard model, length 11 cm, for use with HOPKINS® telescopes 30° – 120° with diameter 4 mm and length 18 cm

- **723750 B**
  - Protection Tube, working length 19.7 cm, for use with HOPKINS® telescopes with length 18 cm
KILLIAN-STRUYCKEN and COTTLE Nasal Specula
BLAKESLEY Nasal Forceps

KILLIAN-STRUYCKEN Nasal Speculum, with set rack, blade length 40 mm, length 15 cm
KILLIAN-STRUYCKEN Nasal Speculum, with set rack, blade length 65 mm
KILLIAN-STRUYCKEN Nasal Speculum, with set rack, blade length 75 mm
COTTLE Nasal Speculum, blade length 55 mm, length 13 cm
BLAKESLEY Nasal Forceps, straight, size 1, working length 11 cm
BLAKESLEY Nasal Forceps, size 3

RUBIN Septum Morcelizer
CRAIG Septum Forceps

RUBIN Septum Morcelizer, with double joint, straight, special matt finish, length 20 cm
CRAIG Septum Forceps, straight, working length 9 cm
Nasal Forceps and Scissors

449002 449003

HEYMANN Nasal Scissors, medium, (standard model), working length 9.5 cm
449003  Same, large, working length 11 cm
468500  BECKER-CAPLAN Septum Scissors, double action jaws, serrated, working length 9.5 cm
489091  COTTLE Dorsal Scissors, angular, with tungsten carbide inserts, heavy, working length 7.5 cm
513200  WALTER Scissors, angled, length 10 cm
449201  RHINOFORCE® II Nasal Scissors, straight, with cleaning connector, working length 13 cm
449202  Same, curved to right
449203  Same, curved to left
“The Diamond Standard”
- Scissors with ultimate cutting quality -

5111010 DS Scissors, extra delicate, straight, sharp/sharp, length 10.5 cm, color code: one gold-plated handle ring
511210 DS Scissors, extra delicate, curved, sharp/sharp, length 10.5 cm, color code: one gold-plated handle ring
511414 DS JOSEPH Scissors, curved, length 14 cm, color code: one gold-plated handle ring
513410 DS COTTLE Scissors, curved, length 10.5 cm, color code: one gold-plated handle ring
513700 DS FOMON Scissors, curved surface, slender, working length 6.5 cm, color code: one gold-plated handle ring

Retractors

505000 COTTLE Retractor, two prongs, sharp prong on left, blunt prong on right, width 10 mm, length 14.5 cm
505100 Same, sharp prong on right, blunt prong on left
499101 Hook, one prong, large curve, length 16.5 cm
488060 Ala Double Hook, with octagonal handle, with 2 sharp points, strongly curved, special matt finish, width 2 mm, length 16.5 cm
506400 AUFRICHT Nasal Retractor, width of retractor blade 8 mm, length of retractor blade 40 mm, length 16.5 cm
# Chisels, Osteotomes and Mallet

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>484004</td>
<td>COTTLE Chisel, flat, graduated, straight, width 4 mm, length 18.5 cm</td>
</tr>
<tr>
<td>484007</td>
<td>Same, width 7 mm</td>
</tr>
<tr>
<td>484009</td>
<td>Same, width 9 mm</td>
</tr>
<tr>
<td>484106</td>
<td>Same, curved, width 6 mm</td>
</tr>
<tr>
<td>484206</td>
<td>COTTLE Crossbar Osteotome, graduated, double-edged grinding, straight, width 6 mm, length 18.5 cm</td>
</tr>
<tr>
<td>484406</td>
<td>Same, single-edged grinding, curved</td>
</tr>
<tr>
<td>486102</td>
<td>WALTER Osteotome, flat, double-edged grinding, width 2 mm, length 19 cm</td>
</tr>
<tr>
<td>486103</td>
<td>Same, width 3 mm</td>
</tr>
<tr>
<td>486104</td>
<td>Same, width 4 mm</td>
</tr>
<tr>
<td>486107</td>
<td>Same, width 7 mm</td>
</tr>
<tr>
<td>486222</td>
<td>BEHRBOHM-WALTER Micro Osteotome, extra delicate, long flat blade, double-edged grinding, with round ergonomic handle and finger grip plate, width 2 mm, length 19 cm</td>
</tr>
<tr>
<td>486223</td>
<td>Same, width 3 mm</td>
</tr>
<tr>
<td>486224</td>
<td>Same, width 4 mm</td>
</tr>
<tr>
<td>484406</td>
<td>Same, width 3 mm</td>
</tr>
<tr>
<td>486243</td>
<td>BEHRBOHM-WALTER Micro Osteotome, curved, extra delicate, with special double cut, with round ergonomic handle and finger grip plate, width 3 mm, length 19 cm</td>
</tr>
<tr>
<td>486253</td>
<td>BEHRBOHM-WALTER Double Concave Hollow Osteotome, extra delicate, with special double-edged grinding, double guarded, with round ergonomic handle and finger grip plate, width 3 mm, length 19 cm</td>
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<tr>
<td>486254</td>
<td>Same, width 4.5 mm</td>
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<tr>
<td>487010</td>
<td>RUBIN Osteotome, flat, straight, double-edged grinding, rounded corners, with finger grip stabilizer, width of cut 10 mm, length 16.5 cm</td>
</tr>
<tr>
<td>487016</td>
<td>Same, width of cut 16 mm</td>
</tr>
<tr>
<td>174200</td>
<td>COTTLE Metal Mallet, length 18 cm</td>
</tr>
</tbody>
</table>
Elevators, Suction Elevator, Double Hooks, Nasal Rasps

474000 FREER Elevator, double-ended, semisharp and blunt, length 20 cm

488074 FREER Elevator, double-ended, sharp and blunt, special matt finish, length 20 cm

479000 MASING Elevator, double-ended, graduated, sharp and blunt, length 22.5 cm

478304 McKENTY Raspatory, width 4 mm, length 14.5 cm

478305 Same, width 5 mm

479800 Suction Raspatory, with stylet, length 19.5 cm

505700 COTTLE Knife Guide and Retractor, one side with two-pronged nostril retractor, other side with flat retractor, with duct for guide of cut, length 19 cm

525870 BEHRBOHM-KASCHKE Straightening Elevator for fractures of the nasal bone and zygomatic Arc. Set of 2 right and left, double-ended, length 27 cm

523600 Nasal Rasp, double-ended, fine, length 21.5 cm

523700 Same, coarse (rasp)

523812 Nasal Rasp, tungsten carbide, double-ended, rasp blades Fig. 1 and 2, coarse, length 20.5 cm
Asian Rhinoplasty

Nasal Dressing Forceps, Cotton Applicator, Columella Clamp, KUHN Frontal Ostium Seeker, BEHRBOHM Caliper

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>417013</td>
<td><strong>Cotton Applicator</strong>, standard model, triangular, serrated, diameter 1.3 mm, length 15 cm</td>
<td>534500</td>
</tr>
<tr>
<td>426516</td>
<td><strong>JANSEN Nasal Dressing Forceps</strong>, bayonet-shaped, length 16.5 cm</td>
<td>629830</td>
</tr>
<tr>
<td>534015</td>
<td><strong>COTTLE Lower Lateral Forceps</strong>, bayonet-shaped, with set screw, serrated tips and teeth on the inside, length 15 cm</td>
<td>525520</td>
</tr>
<tr>
<td>533022</td>
<td><strong>ADSON Dressing Forceps</strong>, serrated, tungsten carbide inserts, length 12 cm</td>
<td></td>
</tr>
<tr>
<td>533112</td>
<td><strong>ADSON Tissue Forceps</strong>, 1 x 2 teeth, length 12 cm</td>
<td></td>
</tr>
<tr>
<td>533212</td>
<td><strong>ADSON-BROWN Tissue Forceps</strong>, atraumatic, fine side grasping teeth, length 12 cm</td>
<td></td>
</tr>
<tr>
<td>534500</td>
<td><strong>COTTLE Columella Clamp</strong>, length 11 cm</td>
<td></td>
</tr>
<tr>
<td>629830</td>
<td><strong>KUHN Frontal Sinus Seeker</strong>, double-ended, No. 6, both sides curved 77°, one tip straight, other tip reverse angle, length 22 cm</td>
<td></td>
</tr>
<tr>
<td>525520</td>
<td><strong>BEHRBOHM Caliper</strong>, for plastic surgery, otoplasty, rhinoplasty, reconstructive and aesthetic surgery, with wheel to set and hold the span, as well as a scale for reading the opening interval, measurement range from 5 – 130 mm, caliper arms have 2 removable attachments with atraumatic measurement points 525523 and 1 holder 525525 for disposable skin marker, [autoclavable], length 18.5 cm</td>
<td></td>
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</tbody>
</table>
Needle Holders and Suction Tubes

515017 Needle Holder, extra delicate, slight spring action, length 17 cm
515515 CRILE-WOOD Needle Holder, length 15 cm
516513 NEIVERT-MASING Needle Holder, thumb ring upturned, one jaw with groove, length 13 cm
529305 FRAZIER Suction Tube, with mandrel and cut-off hole, with distance marking at 5 – 9 cm, 5 Fr., working length 10 cm
529307 Same, 7 Fr.
529309 Same, 9 Fr.
529105 Suction Tube, curved, outer diameter 5 mm, length 16.5 cm
Knives and Surgical Blades

493000 COTTLE Nasal Knife, rounded edge, length 14 cm
496900 MASING Nasal Knife, curved, roundly tipped blade, length 14 cm
496500 Surgical Handle, for miniature blades, round, length 15.5 cm, for Blades 496764 – 70
496764 Miniature Blade, Fig. 64, round, sterile, package of 25
208000 Surgical Handle, Fig. 3, length 12.5 cm, for Blades 208010 – 15, 208210 – 15
496400 MASING Surgical Handle, length 14 cm, for Blades 208010 – 15, 208210 – 15
748000 Surgical Handle, Fig. 7, length 16.5 cm, for Blades 208010 – 15, 208210 – 15
208210 Blade, Fig. 10, sterile, package of 100
208211 Same, Fig. 11
208215 Same, Fig. 15
523913 Metal Tray, for preparing cartilage and bone, with hole for towel forceps, size 10 x 15 cm
IMAGE1 S Camera System

Economical and future-proof
- Modular concept for flexible, rigid and 3D endoscopy as well as new technologies
- Forward and backward compatibility with video endoscopes and FULL HD camera heads
- Sustainable investment
- Compatible with all light sources

Innovative Design
- Dashboard: Complete overview with intuitive menu guidance
- Live menu: User-friendly and customizable
- Intelligent icons: Graphic representation changes when settings of connected devices or the entire system are adjusted
- Automatic light source control
- Side-by-side view: Parallel display of standard image and the Visualization mode
- Multiple source control: IMAGE1 S allows the simultaneous display, processing and documentation of image information from two connected image sources, e.g., for hybrid operations

Dashboard
Live menu
Intelligent icons
Side-by-side view: Parallel display of standard image and Visualization mode
IMAGE1 S Camera System

Brilliant Imaging
- Clear and razor-sharp endoscopic images in FULL HD
- Natural color rendition

Reflection is minimized
- Multiple IMAGE1 S technologies for homogeneous illumination, contrast enhancement and color shifting

FULL HD image

CLARA

FULL HD image

CHROMA

FULL HD image

SPECTRA A*

FULL HD image

SPECTRA B**

* SPECTRA A: Not for sale in the U.S.
** SPECTRA B: Not for sale in the U.S.
IMAGE1 S Camera System

TC 200EN

TC 200EN* IMAGE1 S CONNECT, connect module, for use with up to 3 link modules, resolution 1920 x 1080 pixels, with integrated KARL STORZ-SCB and digital Image Processing Module, power supply 100–120 VAC/200–240 VAC, 50/60 Hz including:
- Mains Cord, length 300 cm
- DVI-D Connecting Cable, length 300 cm
- SCB Connecting Cable, length 100 cm
- USB Flash Drive, 32 GB, USB silicone keyboard, with touchpad, US

* Available in the following languages: DE, ES, FR, IT, PT, RU

Specifications:

<table>
<thead>
<tr>
<th>HD video outputs</th>
<th>Format signal outputs</th>
<th>Power supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>- 2x DVI-D</td>
<td>1920 x 1080p, 50/60 Hz</td>
<td>100–120 VAC/200–240 VAC</td>
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<td>- 1x 3G-SDI</td>
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</table>

<table>
<thead>
<tr>
<th>LINK video inputs</th>
<th>USB interface</th>
<th>SCB interface</th>
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<tbody>
<tr>
<td>3x</td>
<td>4x USB, (2x front, 2x rear)</td>
<td>2x 6-pin mini-DIN</td>
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<table>
<thead>
<tr>
<th>Power frequency</th>
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<tbody>
<tr>
<td>50/60 Hz</td>
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<tr>
<th>Protection class</th>
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<tr>
<td>I, CF-Defib</td>
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<table>
<thead>
<tr>
<th>Dimensions w x h x d</th>
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<tbody>
<tr>
<td>305 x 54 x 320 mm</td>
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<table>
<thead>
<tr>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1 kg</td>
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</tbody>
</table>

For use with IMAGE1 S

IMAGE1 S CONNECT Module TC 200EN

TC 300

TC 300 IMAGE1 S H3-LINK, link module, for use with IMAGE1 FULL HD three-chip camera heads, power supply 100–120 VAC/200–240 VAC, 50/60 Hz, for use with IMAGE1 S CONNECT TC 200EN including:
- Mains Cord, length 300 cm
- Link Cable, length 20 cm

Specifications:

<table>
<thead>
<tr>
<th>Camera System</th>
<th>TC 300 (H3-Link)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supported camera heads/video endoscopes</td>
<td>TH 100, TH 101, TH 102, TH 103, TH 104, TH 106 (fully compatible with IMAGE1 S) 222220055-3, 222220055-3, 222220053-3, 222220060-3, 222220061-3, 222220054-3, 222220085-3 (compatible without IMAGE1 S technologies CLARA, CHROMA, SPECTRA*)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LINK video outputs</th>
<th>Power supply</th>
<th>Power frequency</th>
<th>Protection class</th>
<th>Dimensions w x h x d</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>1x</td>
<td>100–120 VAC/200–240 VAC</td>
<td>50/60 Hz</td>
<td>I, CF-Defib</td>
<td>305 x 54 x 320 mm</td>
<td>1.86 kg</td>
</tr>
</tbody>
</table>

* SPECTRA A: Not for sale in the U.S.
** SPECTRA B: Not for sale in the U.S.
## IMAGE1 S Camera Heads

**NEW**

For use with IMAGE1 S Camera System

**IMAGE1 S CONNECT Module TC 200EN, IMAGE1 S H3-LINK Module TC 300**

and with all IMAGE1 HUB™ HD Camera Control Units

---

### TH 100

**IMAGE1 S H3-Z Three-Chip FULL HD Camera Head,**
50/60 Hz, IMAGE1 S compatible, progressive scan, soakable, gas- and plasma-sterilizable, with integrated Parfocal Zoom Lens, focal length \( f = 15–31 \text{ mm} \) (2x), 2 freely programmable camera head buttons, for use with IMAGE1 S and IMAGE1 HUB™ HD/HD

#### Specifications:

<table>
<thead>
<tr>
<th>IMAGE1 FULL HD Camera Heads</th>
<th>IMAGE1 S H3-Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product no.</td>
<td>TH 100</td>
</tr>
<tr>
<td>Image sensor</td>
<td>3x ( \frac{1}{3}'' ) CCD chip</td>
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<tr>
<td>Dimensions w x h x d</td>
<td>39 x 49 x 114 mm</td>
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<tr>
<td>Weight</td>
<td>270 g</td>
</tr>
<tr>
<td>Optical interface</td>
<td>integrated Parfocal Zoom Lens, ( f = 15–31 \text{ mm} ) (2x)</td>
</tr>
<tr>
<td>Min. sensitivity</td>
<td>F 1.4/1.17 Lux</td>
</tr>
<tr>
<td>Grip mechanism</td>
<td>standard eyepiece adaptor</td>
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<tr>
<td>Cable</td>
<td>non-detachable</td>
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<tr>
<td>Cable length</td>
<td>300 cm</td>
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</tbody>
</table>

---

### TH 104

**IMAGE1 S H3-ZA Three-Chip FULL HD Camera Head,**
50/60 Hz, IMAGE1 S compatible, *autoclavable*, progressive scan, soakable, gas- and plasma-sterilizable, with integrated Parfocal Zoom Lens, focal length \( f = 15–31 \text{ mm} \) (2x), 2 freely programmable camera head buttons, for use with IMAGE1 S and IMAGE1 HUB™ HD/HD

#### Specifications:

<table>
<thead>
<tr>
<th>IMAGE1 FULL HD Camera Heads</th>
<th>IMAGE1 S H3-ZA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product no.</td>
<td>TH 104</td>
</tr>
<tr>
<td>Image sensor</td>
<td>3x ( \frac{1}{3}'' ) CCD chip</td>
</tr>
<tr>
<td>Dimensions w x h x d</td>
<td>39 x 49 x 100 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>299 g</td>
</tr>
<tr>
<td>Optical interface</td>
<td>integrated Parfocal Zoom Lens, ( f = 15–31 \text{ mm} ) (2x)</td>
</tr>
<tr>
<td>Min. sensitivity</td>
<td>F 1.4/1.17 Lux</td>
</tr>
<tr>
<td>Grip mechanism</td>
<td>standard eyepiece adaptor</td>
</tr>
<tr>
<td>Cable</td>
<td>non-detachable</td>
</tr>
<tr>
<td>Cable length</td>
<td>300 cm</td>
</tr>
</tbody>
</table>
Monitors

19" HD Monitor, color systems PAL/NTSC, max. screen resolution 1280 x 1024, image format 4:3, power supply 100–240 VAC, 50/60 Hz, wall-mounted with VESA 100 adaption, including:
- External 24 VDC Power Supply
- Mains Cord

26" FULL HD Monitor, wall-mounted with VESA 100 adaption, color systems PAL/NTSC, max. screen resolution 1920 x 1080, image format 16:9, power supply 100–240 VAC, 50/60 Hz including:
- External 24 VDC Power Supply
- Mains Cord
## Monitors

<table>
<thead>
<tr>
<th>KARL STORZ HD and FULL HD Monitors</th>
<th>19&quot;</th>
<th>26&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wall-mounted with VESA 100 adaption</td>
<td>9619 NB</td>
<td>9826 NB</td>
</tr>
</tbody>
</table>

### Inputs:
- DVI-D: ●
- Fibre Optic: ●
- 3G-SDI: ●
- RGBS (VGA): ●
- S-Video: ●
- Composite/FBAS: ●

### Outputs:
- DVI-D: ●
- S-Video: ●
- Composite/FBAS: ●
- RGBS (VGA): ●
- 3G-SDI: ●

### Signal Format Display:
- 4:3: ●
- 5:4: ●
- 16:9: ●
- Picture-in-Picture: ●
- PAL/NTSC compatible: ●

### Optional accessories:
- 9826 SF: Pedestal, for monitor 9826 NB
- 9619 NB: Pedestal, for monitor 9619 NB

### Specifications:

<table>
<thead>
<tr>
<th>KARL STORZ HD and FULL HD Monitors</th>
<th>19&quot;</th>
<th>26&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Desktop with pedestal</td>
<td>optional</td>
<td>optional</td>
</tr>
<tr>
<td>Product no.</td>
<td>9619 NB</td>
<td>9826 NB</td>
</tr>
<tr>
<td>Brightness</td>
<td>200 cd/m² (typ)</td>
<td>500 cd/m² (typ)</td>
</tr>
<tr>
<td>Max. viewing angle</td>
<td>178° vertical</td>
<td>178° vertical</td>
</tr>
<tr>
<td>Pixel distance</td>
<td>0.29 mm</td>
<td>0.3 mm</td>
</tr>
<tr>
<td>Reaction time</td>
<td>5 ms</td>
<td>8 ms</td>
</tr>
<tr>
<td>Contrast ratio</td>
<td>700:1</td>
<td>1400:1</td>
</tr>
<tr>
<td>Mount</td>
<td>100 mm VESA</td>
<td>100 mm VESA</td>
</tr>
<tr>
<td>Weight</td>
<td>7.6 kg</td>
<td>7.7 kg</td>
</tr>
<tr>
<td>Rated power</td>
<td>28 W</td>
<td>72 W</td>
</tr>
<tr>
<td>Operating conditions</td>
<td>0–40°C</td>
<td>5–35°C</td>
</tr>
<tr>
<td>Storage</td>
<td>-20–60°C</td>
<td>-20–60°C</td>
</tr>
<tr>
<td>Rel. humidity</td>
<td>max. 85%</td>
<td>max. 85%</td>
</tr>
<tr>
<td>Dimensions w x h x d</td>
<td>469.5 x 416 x 75.5 mm</td>
<td>643 x 396 x 87 mm</td>
</tr>
<tr>
<td>Power supply</td>
<td>100–240 VAC</td>
<td>100–240 VAC</td>
</tr>
<tr>
<td>Certified to</td>
<td>EN 60601-1, protection class IPX0</td>
<td>EN 60601-1, UL 60601-1, MDD93/42/EEC, protection class IPX2</td>
</tr>
</tbody>
</table>
Data Management and Documentation

KARL STORZ AIDA® – Exceptional documentation

The name AIDA stands for the comprehensive implementation of all documentation requirements arising in surgical procedures: A tailored solution that flexibly adapts to the needs of every specialty and thereby allows for the greatest degree of customization.

This customization is achieved in accordance with existing clinical standards to guarantee a reliable and safe solution. Proven functionalities merge with the latest trends and developments in medicine to create a fully new documentation experience – AIDA.

AIDA seamlessly integrates into existing infrastructures and exchanges data with other systems using common standard interfaces.

WD 200-XX*

AIDA Documentation System, for recording still images and videos, dual channel up to FULL HD, 2D/3D, power supply 100-240 VAC, 50/60 Hz

including:
- USB Silicone Keyboard, with touchpad
- ACC Connecting Cable
- DVI Connecting Cable, length 200 cm
- HDMI-DVI Cable, length 200 cm
- Mains Cord, length 300 cm

WD 250-XX*

AIDA Documentation System, for recording still images and videos, dual channel up to FULL HD, 2D/3D, including SMARTSCREEN® (touch screen), power supply 100-240 VAC, 50/60 Hz

including:
- USB Silicone Keyboard, with touchpad
- ACC Connecting Cable
- DVI Connecting Cable, length 200 cm
- HDMI-DVI Cable, length 200 cm
- Mains Cord, length 300 cm

*XX Please indicate the relevant country code (DE, EN, ES, FR, IT, PT, RU) when placing your order.
Workflow-oriented use

Patient
Entering patient data has never been this easy. AIDA seamlessly integrates into the existing infrastructure such as HIS and PACS. Data can be entered manually or via a DICOM worklist. All important patient information is just a click away.

Checklist
Central administration and documentation of time-out. The checklist simplifies the documentation of all critical steps in accordance with clinical standards. All checklists can be adapted to individual needs for sustainably increasing patient safety.

Record
High-quality documentation, with still images and videos being recorded in FULL HD and 3D. The Dual Capture function allows for the parallel (synchronous or independent) recording of two sources. All recorded media can be marked for further processing with just one click.

Edit
With the Edit module, simple adjustments to recorded still images and videos can be very rapidly completed. Recordings can be quickly optimized and then directly placed in the report. In addition, freeze frames can be cut out of videos and edited and saved. Existing markings from the Record module can be used for quick selection.

Complete
Completing a procedure has never been easier. AIDA offers a large selection of storage locations. The data exported to each storage location can be defined. The Intelligent Export Manager (IEM) then carries out the export in the background. To prevent data loss, the system keeps the data until they have been successfully exported.

Reference
All important patient information is always available and easy to access. Completed procedures including all information, still images, videos, and the checklist report can be easily retrieved from the Reference module.
Fiber Optic Light Cable

495 NL  Fiber Optic Light Cable, with straight connector, diameter 3.5 mm, length 180 cm

495 NA  Fiber Optic Light Cable, with straight connector, diameter 3.5 mm, length 230 cm

Cold Light Fountain Power LED 175 SCB

20161401-1  Cold Light Fountain Power LED 175 SCB, with integrated SCB, high-performance LED and one KARL STORZ light outlet, power supply 110–240 VAC, 50/60 Hz including:
  Cold Light Fountain Power LED
  Mains Cord
  SCB Connecting Cable, length 100 cm

20132026  Xenon-Spare-Lamp, 175 Watt, 15 Volt

Cold Light Fountain XENON 300 SCB

20133101-1  Cold Light Fountain XENON 300 SCB with built-in antifog air-pump, and integrated KARL STORZ Communication Bus System SCB power supply: 100–125 VAC/220–240 VAC, 50/60 Hz including:
  Mains Cord
  SCB Connecting Cable, length 100 cm

20133027  Spare Lamp Module XENON with heat sink, 300 watt, 15 volt

20133028  XENON Spare Lamp, only, 300 watt, 15 volt
Equipment Cart

**Equipment Cart**
wide, high, rides on 4 antistatic dual wheels equipped with locking brakes 3 shelves, mains switch on top cover, central beam with integrated electrical subdistributors with 12 sockets, holder for power supplies, potential earth connectors and cable winding on the outside,

*Dimensions:*
- Equipment cart: 830 x 1474 x 730 mm (w x h x d),
- shelf: 630 x 510 mm (w x d),
- caster diameter: 150 mm

including:
- **Base module equipment cart**, wide
- **Cover equipment**, equipment cart wide
- **Beam package equipment**, equipment cart high
- **3x Shelf**, wide
- **Drawer unit with lock**, wide
- **2x Equipment rail**, long
- **Camera holder**

**Monitor Swivel Arm,**
height and side adjustable, can be turned to the left or the right side, swivel range 180°, overhang 780 mm, overhang from centre 1170 mm, load capacity max. 15 kg, with monitor fixation VESA 5/100, for usage with equipment carts UG xxx
Recommended Accessories for Equipment Cart

**Isolation Transformer**, UG 310

200 V–240 V; 2000 VA with 3 special mains socket, expulsion fuses, 3 grounding plugs, dimensions: 330 x 90 x 495 mm (w x h x d), for usage with equipment carts UG xxx

**Earth Leakage Monitor**, UG 410

200 V–240 V, for mounting at equipment cart, control panel dimensions: 44 x 80 x 29 mm (w x h x d), for usage with isolation transformer UG 310

**Monitor Holding Arm**, UG 510

height adjustable, inclinable, mountable on left or right, turning radius approx. 320°, overhang 530 mm, load capacity max. 15 kg, monitor fixation VESA 75/100, for usage with equipment carts UG xxx
Notes:
Notes: