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“Use of absorbable membrane in diced cartilage technique for nasal dorsum restoration”

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Author's participation

1. Pasquale Piombino: Surgical procedures
2. Pamela Zace: Data collection
3. Luigi Vaira: Data collection
4. Giacomo De Riu: Surgical procedures
5. Luigi Califano: Surgical procedures

Dear Sir,

Nasal deformities represent the main condition requiring a dorsal nasal reconstruction, in order to obtain a harmonic and pleasant nasal profile, projection and width. Multiple techniques have been described to achieve this purpose, while one of the most commonly used is the “diced cartilage graft” [1-4] We describe a new approach to this surgical procedure where an absorbable collagen membrane is adopted to “wrap” cartilage graft, being a valuable alternative to the currently used materials.

Cartilage grafts may be harvested from different donor sites, based on the quality, the type of nasal deformity and the preference of the surgeon. Septum and ear concha are the mainly adopted donor sites, however when large amount of cartilage is needed, chondrocostal graft represents the gold standard (first choice). [5]

In order to avoid the high rates of complications, such as exposure or resorption, diced cartilage is commonly wrapped in a “sheet” of autologous or allogeneic material that allows it to keep the shape and the position of the graft. [3] Temporal or abdominal fascia are the most commonly used wrapping material however, donor site morbidity, particularly on the temporalis region, is not to be underestimated and for this reason the use of allogeneic materials is proposed. [3]

A small thoracic incision (1-2cm in length) on the 7th-8th rib, under the inframammary sulcus, is performed with an endoscopic-assisted approach in order to harvest the cartilage graft. A Nr 10 surgical blade is used to dice the cartilage in fragments smaller than 1x1mm (Figure 1) which is then inserted into a 1ml insulin syringe. Geistlich collagen membrane 30x40mm (Bio-Gide® Geistlich Biomaterials, Wolhusen, Switzerland) is then sutured with a 5/0 vicryl in a cylindrical shape by being wrapped around the syringe containing the diced cartilage. The syringe content is then poured inside the wrapped “collagen pouch” taking into account the dorsal nasal deficit (Figure 2) and closed with a resorbable 5.0 vicryl suture. The collagen

membrane diced cartilage graft can also be molded with the fingers into a desired form and carefully inserted under the nasal skin. After its placement, the graft can be further molded externally. Nose is taped and dressed as usual and a thermoplastic splint is placed on the dorsum for 4-5 days after the operation. Manual remodeling of the dorsum made by the patient is also possible until 2-3 weeks postoperatively.

Dorsal grafts are widely diffused in nasal surgery and cartilage has become the material of choice for this procedure. Autologous grafts, like calvarian bone, are abandoned due to their high incidence of resorption, exposure and/or donor site morbidity while synthetic implants have higher rate of complications, such as displacement deviation, extrusion, inflammation, infection and changes in skin quality. As a consequence, cartilage has become the first choice for dorsal augmentation and remodeling.

The advantages of using a fascia to wrap the diced cartilage involve the conformational maintenance of the graft and the resorption prevention however its limited amount, the donor site morbidity and the longer operative times should be considered.

We suggest the use of this specific membrane due to its natural bi-layer structure (smooth side for soft tissues and rough for bone) contributing to an excellent adaptation as a functional barrier that is likely to promote optimal healing of the tissues. Its collagen structure acts as a guide for blood vessels regeneration during the healing process with a proper integration of the membrane into the surrounding tissue ensuring the necessary stability of the graft. Membrane is enzymatically degraded in approximately 7 weeks allowing an easy integration of the graft into the donor site. Consequently, the risks of subsequent thickening, late resorptions, infection, inflammation and fibrosis are dramatically reduced.

Diced cartilage graft technique has remarkable benefits. Being autogenous, we don't have a risk of rejection, the graft can be prepared in the surgical field, different donor sites can be used for graft harvesting (rib, concha and septal cartilage), the graft is moldable, and the graft can be reshaped after operation.

Regarding the wrapping material a biodegradable bovine collagen membrane presents numerous advantages compared to materials described in literature, resorption in about 10 weeks, allowing a better graft healing and integration, at the same time, avoiding inflammations, skin retractions and fistulas.

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Figure 1. Diced cartilage graft and remaining graft used for structural rhinoplasty. On the left the collagen membrane.

Figure 2. The syringe containing the diced cartilage and the collagen membrane wrapped around it.

