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Cartilage putty: A novel use of fibrin glue with morselised cartilage grafts for rhinoplasty surgery☆

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Summary Cartilage grafts have multiple purposes within rhinoplasty surgery. The senior author has previously used wrapped diced cartilage grafts but found it difficult to maintain the integrity of the graft "package" during placement. Introduction of Tisseel fibrin glue stabilises the cartilage fragments producing a rubbery mass that can be used like "cartilage putty." This malleable construct can be inserted and moulded with less risk of dispersal.

This technique has now been used on nineteen patients. It has provided a valuable method of reconstruction especially in complex cases such as revision rhinoplasty and patients with a thin dorsal skin envelope. There has been no evidence of graft absorption or requirement for additional surgery to date.

The addition of Tisseel to wrapped diced cartilage grafts, has proven in this series of complex rhinoplasty patients, to be a useful adjunct which aids insertion and contouring. Furthermore, beneficial effects on healing have been demonstrated which contributes to good quality long-term cosmetic results.

Level of Evidence V.

Introduction

The use of diced cartilage grafts in rhinoplasty surgery is not a new technique being initially described as early as 1943 by Peer.[1] However, the use of autologous cartilage was superseded by prosthetic agents during the latter half of the twentieth century. The description by Erol[2] in 2000, of

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Figure 1 The cartilage graft is morselised using a bone mill. The morselised graft is then coated with Tisseel and mixed to create a malleable construct.

"The Turkish Delight" technique in which diced cartilage grafts are wrapped in Surgicel (Johnson & Johnson, Somerville, N.J.), led to a renewed interest. This group provided evidence of extensive use of this technique in primary and secondary rhinoplasty surgery and demonstrated low levels of revision surgery (0.7%) and graft resorption (0.5%). Other authors have also presented evidence of the reliability of this technique.[3] In contrast, Daniel[4] has questioned the use of Surgicel, describing absorption of all surgicel wrapped diced grafts within 3 months. This author has advocated the use of diced cartilage graft wrapped or covered in temporalis fascia.[4,5] The use of acellular cadaveric dermis (Alloderm) has also been reported.[6]

The senior author has previously used diced cartilage grafts wrapped in Surgicel for augmentation of the nasal dorsum. However, the graft can be hard to handle complicating initial placement with the additional risk of early movement. In an attempt to overcome these issues, he developed a technique whereby a fibrin sealant (Tisseel, Baxter UK, Newbury, UK) was used to coat morselised graft to create a "cartilage putty". This facilitates the handling and insertion of the construct and aids contouring of the graft. Similar techniques using diced cartilage graft with fibrin glue have been described.[7,8]

We also believe that Tiseel plays a role in promoting graft take and generalised wound healing. This has previously been shown with skin grafts[9] and also within our department it has been shown to improve alveolor bone graft survival (presented but unpublished). In a recent publication where diced cartilage grafts were stabilised using autologous tissue glue,[10] the authors suggest that fibrin glue promotes cartilage growth and stabilisation. We believe Tisseel has the same properties and this is of particular benefit in the more complex secondary rhinoplasty patients.

Figure 2 The 'cartilage putty' can be shaped, carved and moulded prior to insertion.

Surgical technique

Following a standard open rhinoplasty, cartilage graft harvested from the nasal septum, conchal bowl or costochondral cartilage is morselised using a bone mill (Figure 1). The morselised graft is then coated with Tisseel in its undiluted form (Figure 1). This construct can then be shaped, carved and moulded prior to insertion (Figure 2). The graft is then placed beneath the dorsal skin envelope and further moulding is carried out as required. A nasal splint is applied and left in-situ for up to three weeks.

Clinical series

This technique has now been used in 19 patients. It has provided an invaluable method of reconstruction especially in complex cases in which the individuals have had previous nasal surgery and/or rhinoplasties ($n = 5$). It has provided a solution in patients with a previous history of extrusion