The surgical treatment of rhinophyma—Complete excision and single-step reconstruction by use of a collagen–elastin matrix and an autologous non-meshed split-thickness skin graft

Harald-Franz Selig a,b, David Benjamin Lumenta c, Lars-Peter Kamolz a,c,*

a Section of Plastic, Aesthetic and Reconstructive Surgery, Department of Surgery, State Hospital Wiener Neustadt, Wiener Neustadt, Austria
b Department of Hand Surgery, Rinn Klinikum Bad Neustadt, Bad Neustadt, Germany
c Division of Plastic, Aesthetic and Reconstructive Surgery, Department of Surgery, Medical University of Graz, Graz, Austria

1. Introduction

Rhinophyma is the most common clinical manifestation of phymatosus rosacea.1 Initially presenting with hypervascularization, telangiectasia and chronic hyperplasia of sebaceous glands is followed by nodular nasal enlargement and deformity. Regardless of the severity of its deformity, rhinophyma is considered to be the end stage of chronic acne rosacea.2 While conservative methods (e.g. topical or systemic antibiotics, retinoids) are effective for the treatment of acne rosacea,a a surgical intervention is appropriate and required in established rhinophyma. A variety of surgical techniques to reduce proliferated tissue have been reported. However, a surgical “gold standard” for treating the distorting phymatous skin alterations has not yet been established.

This article details a novel surgical approach: the combination of a bovine collagen–elastin based three-dimensional scaffold (Matriderm®), Dr. Otto Suwelack Skin and Health Care GmbH, Billerbeck, Germany) with simultaneous autologous non-meshed split-thickness skin grafts. This collagen–elastin matrix has been used as a dermal skin substitute for full-thickness skin defects following various underlying pathologies,5–7 including defects after facial burns8 and on the nasal tip.9 So far, there were no reports on the use of a dermal template with split-thickness skin for the coverage of full-thickness defects following excision of rhinophyma.

2. Presentation of the case

From November 2010 to June 2011, we recruited 5 patients (all male, age: 58.8 ± 3.4 years) with rhinophyma. Three of them suffered from nasal obstruction. All patients gave written informed consent to the procedures performed by one plastic surgeon (L.P.K.). 3 out of 5 patients with large lesions were operated on under general anaesthesia. After disinfection of the surgical site, all patients underwent full thickness excision of the involved nasal skin down to the cartilaginous framework but in order to obtain a good take of the matrix and skin graft the perichondrium was kept in place. The excised tissue was sent to histology. After accurate homeostasis, the bovine collagen–elastin matrix (1 mm thickness Matriderm®, Dr. Otto Suwelack Skin and Health Care GmbH, Billerbeck, Germany)
was applied in a dry fashion, customised to the size and contours of the defect, and allowed to moisten from the wound bed. All air bubbles were removed and a non-meshed split-thickness skin graft was applied onto the matrix. A thin non-meshed skin graft with similar colour and texture than the recipient site was harvested and transplanted in order to guarantee a good take rate of the skin graft and thereby a good final result. The dermal matrix and the skin graft were fixated with non-absorbable sutures (Ethilon 5/0, Ethicon Inc., Johnson & Johnson Health Care Systems Inc., New Brunswick, NJ, USA) and a bolster dressing was applied. All patients stayed overnight as in-patients and were reviewed in outpatient clinics 5 days after surgery for the first dressing change. Sutures were removed 7 days after surgery. All patients received only peri-operatively antibiotics. Follow-up was then performed on 3 and 6 months postoperatively. Time to complete healing was achieved within 2 weeks in all patients. Diagnosis was confirmed by histology and malignant cell transformation excluded in all patients. Demodex follicorum was diagnosed in 1 patient based on histology. No postoperative complications were observed. None of the patients showed signs of hypertrophic scarring or recurrence within the 6 month follow-up period. All patients were satisfied with the functional and aesthetic result, and no surgical revision was either required or requested (Figs. 1–3).

3. Discussion

In this article, we present a novel surgical approach to treat rhinophyma. This technique combines deep excision followed by coverage with a collagen–elastin matrix for dermal substitution and autologous epithelial replacement. All our patients were successfully treated with satisfying functional and aesthetic results.

Our approach was based on the following considerations: deep excision facilitates complete removal of diseased tissue that ultimately reduces the risk of recurrence in contrast to commonly applied methods relying predominantly on superficial lesion removal with subsequent spontaneous re-epithelialization. The
Fig. 3. Result 6 month after deep exzision and grafting (Matriderm® and unmeshed split thickness skin grafting); stable result with no nasal obstruction.

application of a dermal substitute to create a neodermis covered by split-thickness autologous skin grafting may serve as a functionally and aesthetically appropriate model without requiring the recruitment of donor sites for full-thickness skin grafts or even local flaps (e.g. forehead flap). The reconstructed neodermis will improve the final skin quality and thereby help to avoid secondary skin contraction. The variety of surgical techniques needs to take practically and clinically relevant considerations into account, notably costs, time-to-healing, safety and recurrence rate.

With regard to financial concerns, it appears to be obvious that the acquisition of advanced surgical techniques (e.g. hydrosurgery, laser) involves higher costs than the use of a “cold knife”. Additional maintenance fees for these devices may also need to be considered. Whether the use of a dermal template in this context is more cost-efficient than the above-mentioned techniques ultimately depends on the case-load or frequent usage of such devices. From a purely economic point-of-view, the “off-the-shelf” availability of dermal templates in combination with “traditional” surgical techniques seems to be a reasonable approach in the light of the overall incidence of rhinophyma.

Looking at patient safety and applicability, “cold” excision, dermabrasio, cryosurgery and electrosurgery are described as techniques associated with easy handling, and a special training is certainly required for the use of argon- and carbon dioxide laser therapy.4 Difficulties in depth control for tissue removal are reported for dermabrasio, argon laser and electrosurgery. “Cold” excisional techniques and cryosurgery, however, have been reported to result in difficulties in achieving adequate haemostasis, which is also their main disadvantage.4

With regard to recurrence rates after surgical treatment of rhinophyma, only scarce data from long-term follow-up studies exist.1 Some case series of patients who were treated with carbon dioxide lasers had a follow-up of up to 10 years.10,11

Finally, the risk of malignancies hidden within rhinophyma is a major issue. In line with Lazzeri et al.,12 we emphasize the need for histologic evaluation of excised tissue that is guaranteed by almost all techniques except for carbon laser and electrocautery.13

4. Conclusion

We consider our presented technique to be a safe and effective approach to treat rhinophyma. The combination of deep excision and single-step replacement of epidermal–dermal components may ultimately avoid the recurrence of rhinophyma and contribute to a full skin repair leading to satisfactory functional and aesthetic outcome. Due to the low incidence of this end-stage-entity of phytamous rosacea, larger case series are warranted to allow for evidence-based comparison of different techniques ideally using a long-term follow-up.

Conflict of interest statement

None of the authors disclose any financial and personal relationships with other people or organizations that could inappropriately influence (bias) their work.

Funding

None.

Ethical approval

Written consent was obtained.

Author contribution

All the authors contributed to data collection and writing.

References