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PILOT STUDY

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Pilot Study: Use of Stem Cell Therapy and Diced Cartilage in Secondary Rhinoplasty Cases Clinical Outcomes: The Golden Turkish Delight

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Background: Although many techniques in the secondary rhinoplasty field have been developed in recent years, there are debates regarding achieving results with a high satisfaction rate. We aimed to share the surgical use technique in secondary rhinoplasty patients by enriching the Turkish delight technique with mesenchymal stem cells, which we described as the golden Turkish delight (GTD) technique, and the long-term patient satisfaction results.

Methods: The study was planned as prospective research, and 30 secondary rhinoplasty patients who presented to our service for rhinoplasty were included. The GTD technique was applied to these patients. The patient's satisfaction with the surgical procedure was evaluated at least 9–12 months after the surgery, and the Global Aesthetic Improvement Scale (GAIS) was used as a measurement tool.

Results: Of the participants, the satisfaction levels of 30 patients were evaluated with a 1-year follow-up on average, and the rate of those who improved was found to be 80% using the GAIS score. The rate of those with high GAIS scores and those with high satisfaction levels was approximately 56%. Twenty percent of the patients were not satisfied with the result.

Conclusions: When we evaluate the postoperative 1-year results of our patients in terms of satisfaction and complications, we may state that the absorption that may occur in the Turkish delight technique over time could give better results with the GTD technique. In addition to GTD and fat graft support, regenerative medicine products such as stromal vascular fraction are very effective in obtaining favorable results.
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INTRODUCTION

Although many techniques in the secondary rhinoplasty field have been developed in recent years, there are debates regarding achieving results with a high rate of satisfaction. Especially after recurrent rhinoplasty, aesthetic and functional outcome concerns pose difficulties even for experienced surgeons.[1] Repairing some changes, traumas, and disorders caused by the main problem in the nose and previous surgery with regenerative medicine techniques is used in all areas of medicine.[2,3] For a better secondary rhinoplasty, commonly reported problems and underlying problems after primary rhinoplasty should be determined as well as corrected.[4]

As a result of all these situations, several methods are researched due to the special situation of secondary rhinoplasty. Particularly, the importance of the regenerative medicine field has gradually increased in recent years. Many preclinical and clinical studies have demonstrated the role of mesenchymal stem cells in tissue repair. The regenerative skills of mesenchymal stem cells and discoveries in stem cell biology will empower and perfect available surgical techniques in aesthetic surgery. Here, the activity and support of mesenchymal

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stem cells, and therefore fibroblasts, constitute a significant mechanism.[5,6]

Autologous fat grafting is frequently used for tissue rejuvenation and filling. Stromal vascular fraction (SVF) obtained from autologous fat grafting is also remembered as an important development in regenerative medicine.[7–9] During surgery, lipofilling materials, mainly including SVF, can be produced from autologous fat grafting.[10–13] In recent decades, a fat procedure called lipofilling has been described; Tonnard et al[14] also proposed that this technology may improve skin quality with nanofat.

Although autologous cartilage grafts are widely used in rhinoplasty, there are difficulties due to deformity or absorption occurring over time.[15] The technique developed by wrapping the minced cartilage with an absorbable hemostat (Surgicel) is successfully used in both primary and secondary rhinoplasty, reducing potential cartilage graft complications.[16,17] In a study conducted on nasal dorsum augmentation with minced cartilage, also known as the Turkish delight technique, involving 2365 patients, an absorption problem was observed only in 11 patients as a result of a 10-year follow-up-.[18]

By using these three valuable techniques in combination, namely SVF fat grafts obtained with autologous fat grafting, fibroblast support with mesenchymal stem cells, and minced autologous cartilage grafts, we developed the golden Turkish delight (GTD) technique. In this study, we aimed to share the surgical use technique in secondary rhinoplasty patients by enriching the Turkish delight technique with mesenchymal stem cells, and present long-term patient satisfaction results.

PATIENTS AND METHODS

The study was planned as prospective research, and secondary rhinoplasty patients who presented to Ankara Bilkent City Hospital plastic, reconstructive, and aesthetic surgery service for rhinoplasty were included.

Thirty patients between 18 and 60 years of age who underwent one or more rhinoplasty procedures between January 2021 and June 2022 and who were not satisfied with the result both in terms of appearance and function were included in this study where closed rhinoplasty technique was applied. Those who did not agree to participate in the study, primary rhinoplasty patients, and patients with mental problems were excluded from the study. Secondary rhinoplasty procedures of all patients were performed with a closed rhinoplasty using the GTD technique.

Evaluation of the patients' satisfaction with the surgical procedure was made at least 9–12 months after the surgery, and the Global Aesthetic Improvement Scale (GAIS) was used as the measurement tool. (**See table, Supplemental Digital Content 1**, which shows the GAIS. **http://links.lww.com/PRSGO/D565**.) The study was conducted in line with the principles of the Declaration of Helsinki. Ethical approval for the study was obtained from the Ethics Committee of Ankara Bilkent City Hospital.

Takeaways

Question: Can we use the Turkish delight technique in secondary rhinoplasty cases more effectively?

Findings: We developed the Turkish delight technique by combining all three valuable materials and defined it as golden Turkish delight with stromal vascular fraction, mesenchymal stem cells, and fat grafts.

Meaning: We aimed to show clinical effects of the Turkish delight technique, which creates fat components and mesenchymal stem cells with cartilage and Surgicel, on the long-term results of secondary rhinoplasty cases more effectively.

Surgical Technique

In the preparation of fat grafts, first of all, fat grafts are taken from patients under general anesthesia from the abdominal and thigh area through liposuction by using a multiport cannula of 1 mm in diameter and 3 mm in sharpness and 50-mL injector with negative pressure. Then, the grafts are left to rest in tubes for 5 minutes, and fat grafts are separated through the precipitation method. Fat grafts are collected through the sieving method by using mesh gauze. After that, fat grafts are taken into 10-mL syringes and prepared by passing through a connector with a diameter of 2 mm 10–15 times. SVF is centrifuged by passing it through a 1.2-mm connection apparatus between two Luer lock syringes for 1 minute at a speed of 10 mL/s (Fig. 1). For all patients, a fibroblast-activating solution prepared in a laboratory environment and enriched with alloplastic mesenchymal stem cells was kept ready during the surgery. Cartilage grafts are minced in 0.5- and 1-mm sizes and enriched by wrapping them with SVF, alloplastic mesenchymal stem cells, and minced autologous cartilage in an absorbable hemostat (Surgicel). In the nasal dorsum augmentation phase, the GTD is applied. Lipofilling is applied to the nasal dorsum and nasal base areas as needed (Fig. 2). Fat grafts are applied to the facial area, zygoma, chin-neck dorsum, and columella area with a 21-G syringe and a cannula. The remaining SVF is applied to the facial skin with the help of a roller by opening canals in the form of mesotherapy. [**See Video (online)**, which displays the golden Turkish delight technique.)

RESULTS

GTD was applied to 30 secondary rhinoplasty patients. Of the participants, 80% (24) were female and 20% (six) were male, with a mean age of 30.2 ± 9.4 years. Fifty percent (15) of the participants were employed, 30% (nine) had no income, 20% (six) were single, 30% (nine) were smokers, 56% (16) had a university education or above, and 63.3% (19) did not have any children (Table 1).

The surgery lasted 60 minutes on average. An average of 10 mL (range 7–50 mL) fat graft was taken. The fat graft volume enriched with the SVF used was between 3 and 5.5 mL, with an average volume of 4.1 mL.

Satisfaction levels of the 30 patients were evaluated with a 1-year follow-up on average, and the rate of those who improved was found to be 80% using the GAIS score.

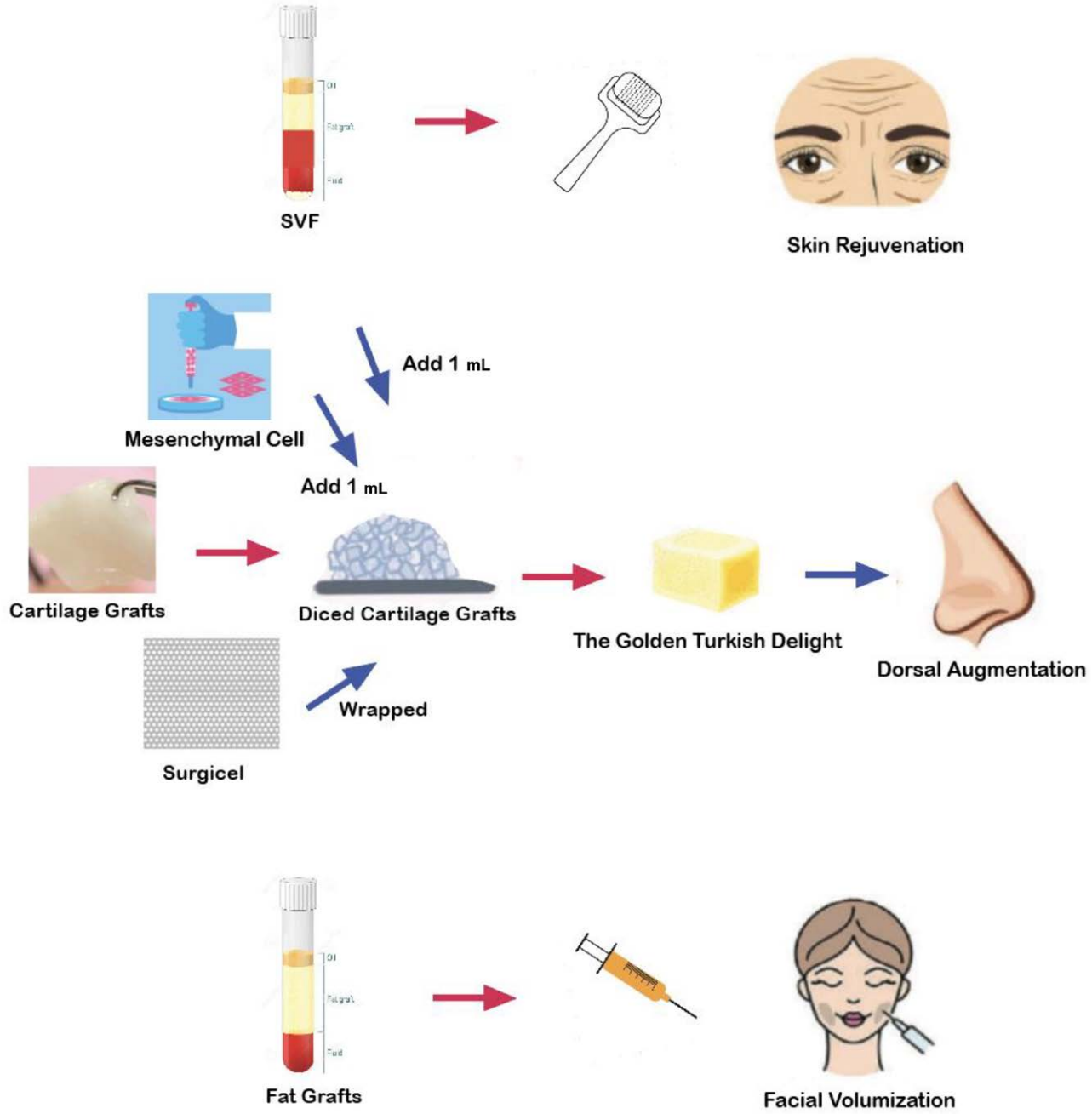

Fig. 1. Schematic illustration of preparing the golden Turkish delight and adipose component.

The rate of those with high GAIS scores, that is, those with high levels of satisfaction, was determined to be approximately 56%. Ten percent of the respondents reported poor satisfaction, and 10% stated their satisfaction level as no change. Twenty percent of the patients were not satisfied with the result. (**See table, Supplemental Digital Content 2**, which shows the GAIS score results. **http://links.lww.com/PRSGO/D566**.)

When the patients were asked about skin quality following fat graft injection obtained from liposuction and SVF, it was observed that all were satisfied in general. No complications were observed except for one patient, who developed a local infection in the incision line and recovered with conventional wound care. The mean ± SD injected volumes of fat grafts, SVF, and GTD during the initial operation were 3±0.6, 1±0.2, and 1±0.3, respectively. Long-term postoperative results of patients receiving fat grafts and GTD are presented (Figs. 2–4).

DISCUSSION

A study involving 2365 patients was conducted by Erol, developing the Turkish delight technique for the first time.[18] In addition, the nose reconstruction technique

Fig. 2. Patient 1 using the GTD technique and fat grafts product: before (A, C, E) and after (B, D, F) photographs.

Table 1. Patient Demographics

	Value (%)
No. of patients	30
Mean age ± SD, y	30.2 ± 9.4
Sex	
Female	24 (80.0)
Male	6 (20.0)
In labor force	
No	15 (50.0)
Yes	15 (50.0)
Income class	
Nonincome	9 (30.0)
Lower	6 (20.0)
Lower-middle	7 (23.3)
Upper-middle	7 (23.3)
Upper	1 (3.3)
Marital status	
Not currently married	20 (66.6)
Married	10 (33.3)
Smoker	9 (30.0)
Alcohol users	3 (10.0)
Level of education	
High level (university, postgraduate)	16 (56.0)
Others	14 (44.0)
No. of children	
None	19 (63.3)
One	4 (13.3)
Two or more	7 (23.3)

with minced cartilage wrapped with an absorbable hemostat was applied to 350 secondary rhinoplasty patients, and in the 10-year follow-up, swelling in six patients, absorption problems in 11 patients, and fibrosis in 16 patients were observed.[18] In our study, with similar complaints being mainly in the low-satisfaction group, infection developed only in one patient in the early period of the 1-year follow-up. Nevertheless, longer-term follow-ups are necessary to determine the disappearance of surgery effects following rhinoplasty procedures.

The common opinion in studies conducted on secondary rhinoplasty is that patients experience contour irregularities and fine skin problems.[19] In our study, regenerative medicine techniques were used to eliminate such situations.

In several studies conducted, it is mentioned that in the classical Turkish delight technique, minced cartilage wrapped in an absorbable hemostat (Surgicel) was absorbed in a short time, and a shape could not be given. On the other hand, in the minced cartilage wrapped with facia technique, absorption and shaping problems were reported not to be experienced longer.[20,21] In our study, regenerative medicine techniques were used to eliminate the absorption problem, which proved useful in terms of patient satisfaction.

In a study conducted on minced cartilage absorption in animals, it was observed that minced cartilage left on different anatomical layers had different absorptions

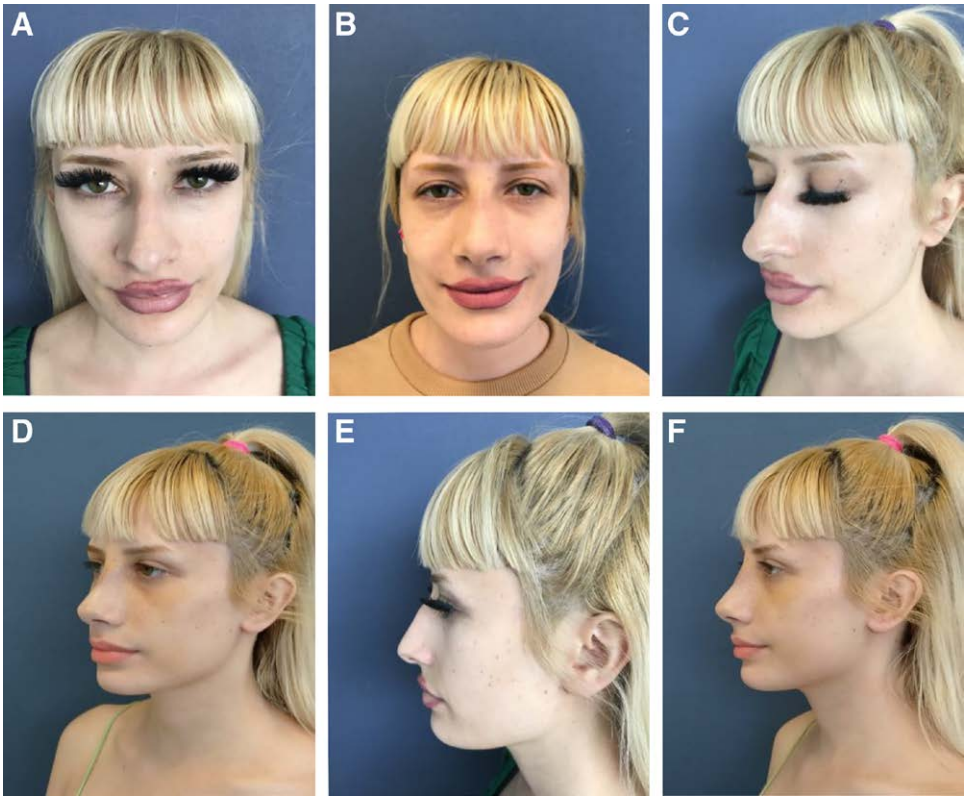

Fig. 3. Patient 2 using the GTD technique and fat grafts product: before (A, C, E) and after (B, D, F) photographs.

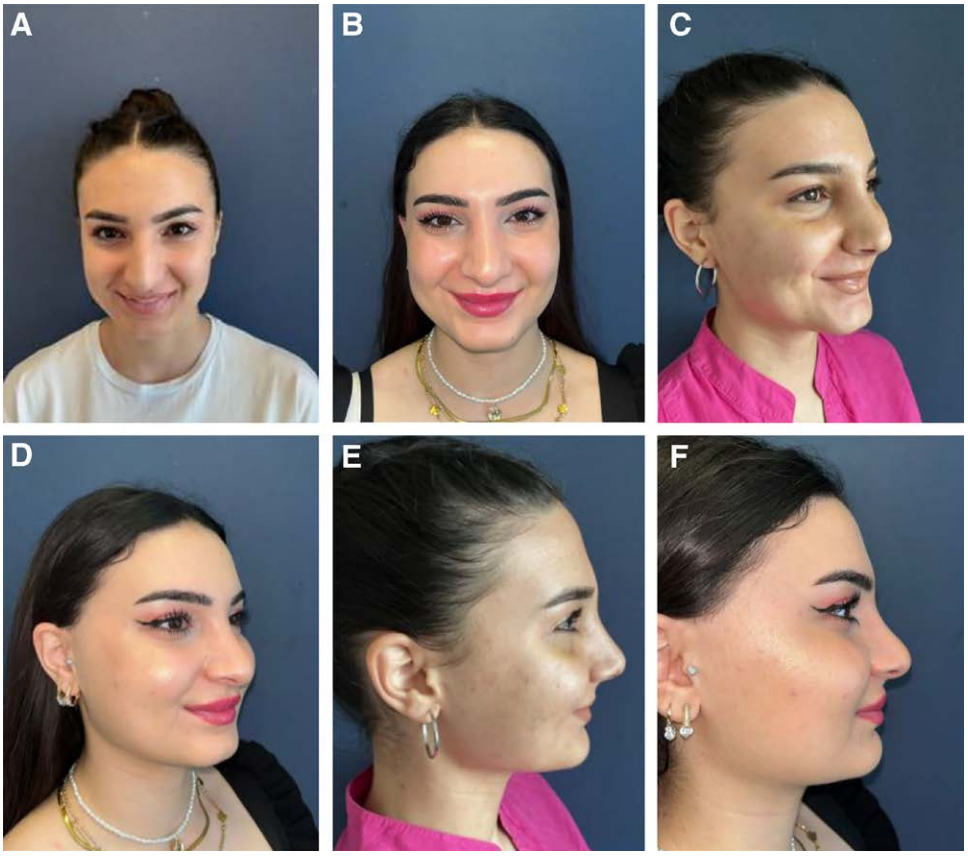

Fig. 4. Patient 3 using the GTD technique and fat grafts product: before (A, C, E) and after (B, D, F) photographs.

and that the cartilage graft placed under the superficial musculoaponeurotic system persisted longer compared with subperiosteale and subperichondrial areas.[22] Studies showing that chondrocytes can survive better in areas with high viability may indicate the necessity of regenerative medicine procedures.

When looked at in the context of alloplastic materials, in recent studies, absorption problems were significantly eliminated as a result of modification of the Turkish delight technique with 1–2 mL autologous blood to overcome absorption and replacement problems resulting from the Turkish delight technique.[23] We believe that our study contributed to overcoming similar problems with SVF and mesenchymal stem cell techniques. In a comparative study conducted on animals by modifying the Turkish delight technique by wrapping with alloderm, it was demonstrated that longer-term absorption problems were not experienced.[24]

When we evaluate the postoperative 1-year results of our patients in terms of satisfaction and complications, we may state that the absorption that may occur in the Turkish delight technique over time could give better results with the GTD technique. We believe that an 80% satisfaction rate and a 56% rate of very high satisfaction are very valuable for this group of patients. In addition to GTD and fat graft support, regenerative medicine products such as SVF are very effective in obtaining positive results. Nevertheless, reliable, randomized, prospective, and comparative studies that will evaluate the effectiveness of regenerative medicine technology are still limited in number.

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DISCLOSURE

The authors have no financial interest to declare in relation to the content of this article.

PATIENT CONSENT

Patients provided written consent for the use of their images.

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