



RESEARCH

DOES FLAP THICKNESS AFFECT THE INCIDENCE OF FREY'S SYNDROME AFTER SUPERFICIAL PAROTIDECTOMY?

Sinan KOCATÜRK, MD.; Nurettin ÖZDEMİR, MD.; Erkan ÖZTÜRK, MD.; Ünsal ERKAM, MD.;
Aykut BABİLA, MD.

Department of II ENT, SSK Ankara Research and Education Hospital, Ankara, Türkiye

SUMMARY

The effect of the skin flap in the development of Frey's syndrome after superficial parotidectomy has been investigated by preparing the sub-superficial musculoaponeurotic system (Sub-SMAS) skin flap in 10 patients and the subcutaneous skin flap in 9 patients. Clinical questioning (subjective) and Minor's starch iodine test (objective) have been used in the assessment of the patients. The time elapsed till Minor's starch iodine test has been done after parotidectomy is 13 months on average in the subcutaneous group and 16 months in the sub-SMAS group. In the Sub-SMAS flap group, subjective Frey syndrome was 20% and objective Frey syndrome was found at the rate of 30%. In the subcutaneous flap group, subjective Frey's syndrome was 33.3% and objective Frey's syndrome was 33.3%. There is no statistically significant difference between subcutaneous and sub-SMAS flaps with respect to the frequency of Frey's syndrome ($p>0.05$).

Keywords: Frey's Syndrome, parotidectomy, skin flap

CİLT FLEBİ SÜPERFİSYAL PAROTİDEKTOMİDE FREY SENDROMU GELİŞİM SIKLIĞINI ETKİLİYOR MU?

ÖZET

Cilt flebinin Frey sendromu gelişimindeki etkinliğini 10 hastada sub-süperfişyal muskuloaponevrotik sistem (sub-SMAS) cilt flebi , 9 hastada subkutanöz cilt flebi hazırlanarak incelenmiştir. Hastaların değerlendirilmesinde klinik sorgulama (subjektif) ve Minor's iodine nişasta testi (objektif) kullanılmıştır. Parotidektomiden sonra Minor's test yapılarına kadar geçen süre subkutanöz grupta ortalama 13 ay ve sub-SMAS grupta ise 16 ay'dır. Sub-SMAS cilt flebi grubunda subjektif Frey sendromu %20, objektif Frey sendromu %30 oranında bulundu. Subkutanöz flep grubunda subjektif Frey sendromu %33.33, objektif Frey sendromu %33.3 oranında bulundu. Frey sendromu gelişim oranları bakımından subkutanöz ve sub-SMAS grupları arasında istatistiksel fark tespit edilmedi ($p>0.05$).

Anahtar Sözcükler: Frey sendromu, parotidektomi, cilt flebi

INTRODUCTION

The incidence of symptomatic Frey's syndrome after superficial parotidectomy is 10-48%¹. In cases monitored with Minor's iodine test, on the other hand, the incidence of subclinic Frey's syndrome is 96-100%^{2,3}.

Many techniques have been tried to reduce the incidence of Frey's syndrome. In all the surgical methods the aim is based on forming a barrier between the sweat glands in the skin and the postganglionic nerve fibres lying open. With this aim, the sternocleidomastoid muscle (SCM) flap^{4,5}, the temporoparietal fascia flap (TPFFs)⁶, the superficial musculoaponeurotic system (SMAS)⁷ rotation flap and various implants (lyophilised dura, ethisorb, and politetrafloroetilen-PTFE) have been used⁸.

Another important factor affecting the development of Frey's syndrome is the intraoperatively prepared skin flap. It has been reported that in cases in which the skin flap is elevated so as to contain the skin and the SMAS as a single unit, the incidence of Frey's syndrome is decreased^{8,10,11}. In cases in which a subcutaneous flap is elevated the incidence of Frey's syndrome is increased despite the higher oncological security margins¹².

In this study, the ratios of Frey's syndrome in patients elevated the sub-SMAS and subcutaneous flaps have been investigated with clinical questioning (subjective) and Minor's iodine starch test (objective).

MATERIALS AND METHOD

Nineteen patients who came to our clinic with the diagnosis of mass in the parotid gland between 1999-2001 have been included in this prospective study. In 10 patients the Sub-SMAS skin flap and in 9 patients the subcutaneous skin flap have been elevated and superficial parotidectomy has been performed. The average

Corresponding Author: Sinan Kocatürk MD., Dep. of II. ENT, SSK Ankara Research and Education Hospital, Ankara, Turkey, Tel: +90 312 4473735, Fax: +90 312 3186690, E-mail: sinankocaturk@yahoo.com

Received: 21 February 2003, revised for: 8 April 2003, accepted for publication: 18 April 2003



age of the patients are 46 in the sub-SMAS group and 49 in the subcutaneous group. The time elapsed till Minor's starch iodine test has been done after parotidectomy is 13 (range 8-17 months) months on average in the subcutaneous group and 16 (range 8 -24 months) months on average in the sub-SMAS group. The minimum follow-up period is 8 months.

For both groups, patients having one of the following conditions have been excluded from the study:

1. Patients operated on for a malign tumour in the parotid gland,
2. Patients re-operated on for relapse,
3. Patients receiving radiotherapy or patients who have had total parotidectomy or enucleation,
4. Diabetic patients,
5. Patients receiving treatment for excessive sweating or using anticholinergic drugs for other reasons,
6. Patients after whose operation a period of less than 8 months has elapsed.

The patients have been reached through telephone and mail. In the clinical questioning the patients have been asked whether they had sweating and wetness in the face during meals and blushing in the face and if the patients confirmed these complaints it has been asked when the complaints started after the operation.

In all the patients classical Blair incision was used .The Sub-SMAS flap was elevated over the parotid fascia with sharp dissection while preserving the continuity of the SMAS. In the part of the incision extending to the cervical region a supraplatismal flap was prepared. The subcutaneous flap was elevated from the level of the hair follicles (Figure 1).



Figure 1: The subcutaneous flap; elevated from the level of the hair follicles.

The patients were assessed with the Minor's starch iodine test with respect to Frey's syndrome (objective-subclinic cases). The test was performed on both sides of the face and the side not operated on was used as the control group. First, in patients who were fasted for at least 1 hour the test region was stained with 10% iodine solution and was left to dry out. Later the region was stained completely white by sprinkling with starch powder. The patients were asked to suck or eat lemon for 1 hour to stimulate salivation. The patients were assessed with respect to the findings of Frey's syndrome at 0-30-60 minutes.

During the test, the change in colour (blue-black) in the parotidectomy region was accepted as a positive result (Figure 2).



A



B

Figure 2 :A positive Minor's test; the iodine reacting with starch and the color change is observed.

2A: 30 minutes later

2B: 60 minutes later

RESULTS

There were findings of Frey's syndrome in 2 patients in the Sub-SMAS group (%20, 2/10) and in 3 patients in the subcutaneous group (%33.3, 3/9) with specific clinical questioning.



With Minor's test, a positive test result was obtained in 3 patients (30%) in the sub-SMAS group and in 3 patients (33.3%) in the subcutaneous group. Positive results were obtained in none of the patients on the control side (the non-operated side). These values were assessed with an chi square test. There is no statistically significant difference between subcutaneous and sub-SMAS flaps with respect to the frequency of Frey's syndrome ($p>0.005$)

The incidence of subclinic Frey's syndrome was 10% (1/10) in the sub-SMAS group. Subclinic Frey's syndrome was not found in the subcutaneous group.

In the clinical questioning, no reliable information could be obtained in both groups as to when the complaints had started in patients who were symptomatic so, no comparison could be made regarding this matter.

DISCUSSION

Frey's syndrome having the typical symptoms of blushing, sweating and tenderness in the parotid region while eating was first described by the French neurologist Lucia Frey in 1923¹³. The French neurologist Andre Thomas is the first physician proposing the aberrant regeneration theory towards an understanding of the physiopathology of the syndrome⁸. In various publications, it is written that the incidence of Frey's syndrome is lower in extracapsular enucleation than in superficial parotidectomy and it is also written that it is less frequently observed in partial parotidectomies than in total parotidectomies¹⁴.

In the literature, it is reported that with specific questioning the rate of patients with Frey's syndrome after parotidectomy is 10-30%¹⁵. We detected the findings of Frey's syndrome at the rate of 20% in sub-SMAS group and 33.3% in subcutaneous group with specific questioning (subjective).

Another important factor affecting the development of Frey's syndrome may be the intraoperatively prepared skin flap. It is reported that in cases in which the skin and the SMAS are elevated as a single unit the incidence of Frey's syndrome is decreased^{9, 11}. Some authors report that they have reduced the incidence of Frey's syndrome to the level of 2% with only a sub-SMAS flap¹. Although the oncological security margins are higher in the case of subcutaneous (thin) flap elevation the rates of Frey's syndrome are increased¹². On the other hand, Taylor et al.

report that there is no difference between subcutaneous and sub-SMAS flaps with respect to the frequency of Frey's syndrome¹⁶. In our series, there is no statistically significant difference between subcutaneous and sub-SMAS flaps with respect to the frequency of Frey's syndrome with Minor's test (33.3% and 30% respectively) ($p>0.05$).

Although the findings of Frey's syndrome frequently occur 3 months to 2 years after parotid surgery¹⁷, cases in which symptoms emerge as early as 1 month¹⁶ or as late as 5 years have also been reported¹⁸. There are difficulties in comparing the methods aimed at preventing Frey's syndrome due to differences in the postoperative follow-up periods.

CONCLUSION

Although there are very different views in the literature, we have reached these conclusions:

1-There is a proportional decrease in the incidence of Frey's syndrome in the sub-SMAS group. However, statistically no difference has been detected between the two groups ($p>0.05$). This result can probably be accounted for by the scarcity of the number of cases. In addition, the shorter follow-up period in the subcutaneous group compared to the sub-SMAS group may also have been effective.

2-Although the rate of symptomatic patients was % 20 (sub-SMAS) and %33.3 (subcutaneous) upon specific questioning, absence of patients applying for treatment suggests that the ratio of the patient group requiring treatment for Frey's syndrome is very low.

REFERENCES

1. Allison Gr, Rappaport I. Prevention of Frey's syndrome with superficial musculoaponeurotic system interposition. *Am J Surg.* 1993 Oct;166(4):407-10 PMID: 8214303
2. Kornblut AD, Westphal P, Miehke A. A reevaluation of the Frey syndrome following parotid surgery. *Arch Otolaryngol.* 1977;103(5):258-61. PMID: 857787
3. Sultan MR, Wider TM, Hugo NE. Frey's syndrome: prevention with temporoparietal fascial flap interposition. *Ann Plast Surg.* 1995;34(3):292-6; discussion 296-7. PMID: 7598387
4. Sood S, Quraishi C.R, Jennings,Bradley PJ. Frey's syndrome following parotidectomy: prevention using a rotation sternocleidomastoid muscle flap. *Clin Otolaryngol.* 1999;24(4):365-8. PMID: 10472476
5. İnal E, Kemaloğlu YK, Hiçyılmaz ÖC. Parotis Cerrahisinde Frey Sendromu'nun Önlenmesi ve Kozmetik Yönden



- Sternokleidomastoid Kas Flebi. K.B.B ve Baş Boyun Cerrahisi Dergisi. 1993;2:122-126
6. Rubinstein RY, Rosen A, Leeman D. Frey syndrome: treatment with temporoparietal fascia flap interposition. *Head Neck Surg.* 1999 Jul;125(7):808-11. PMID: 10406323
 7. Bonanno PC, Palia D, Rosenberg M, Casson P. Prophylaxis against Frey's syndrome in parotid surgery. *Ann Plast Surg.* 2000 May;44(5):498-501. PMID: 10805299
 8. Dulguerow P, Quinodoz D, Cosendai G, Piletta P, Marchal F, Lehmann W. Prevention of Frey syndrome during parotidectomy. *Arch Otolaryngol Head Neck Surg.* 1999 Aug;125(8):833-9. PMID: 10448728
 9. Singleton G, Cassini NJ. Frey's syndrome: incidence related to skin flap thickness in parotidectomy. *Laryngoscope.* 1980;90(10 Pt 1):1636-9. PMID: 7421376
 10. Casler JD, Conley J. Sternocleidomastoid muscle transfer and superficial musculoaponeurotic system plication in the prevention of Frey's syndrome. *Laryngoscope.* 1991;101(1 Pt 1):95-100. PMID: 1984560
 11. Bonanno P, Casson P. Frey's syndrome: a preventable phenomenon. *Plast Reconstr Surg.* 1992;89(3):452-6; discussion 457-8. PMID: 1741468
 12. Moulton-Barrett R, Allison G, Rappaport I. Variation's in the use of SMAS (superficial musculoaponeurotic system) to prevent Frey's syndrome after parotidectomy. *Int Surg.* 1996;81(2):174-6. PMID: 8912087
 13. Laccourreye O, Bernard D, de Lacharriere O, Bazin R, Brasnu D. Frey's syndrome analysis with biosensor. A preliminary study. *Arch Otolaryngol Head Neck Surg.* 1993;119(9):940-4. PMID: 8395192
 14. Wennmo C, Spandow O, Emgard P, Krouthen B. Pleomorphic adenomas of the parotid gland: superficial parotidectomy or limited excision? *Laryngol Otol.* 1988;102(7):603-5. PMID: 3411212
 15. Linder TE, Huber A, Schmid S. Frey's syndrome after parotidectomy: a retrospective and prospective analysis. *Laryngoscope.* 1997;107(11 Pt 1):1496-501. PMID: 9369396
 16. Taylor SM, Yoo J, Matthews WT., Lampe H.B., Trites J.R. Frey's syndrome and parotidectomy flaps: A retrospective cohort study. *Otolaryngol Head Neck Surg.* 2000;122(2):201-3. PMID: 10652390
 17. Yu Lt, Hamilton R. Frey's syndrome: prevention with conservative parotidectomy and superficial musculoaponeurotic system preservation. *Ann Plast Surg.* 1992;29(3):217-22. PMID: 1326250
 18. Laccourreye H, Laccourreye O, Cauchois R, Jouffre V, Menard M, Brasnu D. Total conservative parotidectomy for primary benign pleomorphic adenoma of the parotid gland: a 25-year experience with 229 patients. *Laryngoscope.* 1994;104(12):1487-94. PMID: 7990639