The Scaphomastoid Suture as an Alternative Surgical Technique for Prominent Ear Deformity

E Sari

ABSTRACT

Background: *A prominent ear is a common disorder which affects the patient's social relations and physiological condition. This deformity can be corrected by using several well-known methods ranging from early splinting to surgery. This study presents yet another new and practical method for protruding ear correction.*

Patients and method: *A total of 40 patients (male, n = 19; female, n = 21) with 76 prominent ears were operated on using the proposed technique. The conchomastoid measure was between 2–4.5 cm with an average of 2.8 cm before the surgery. Being the traditional method, postauricular incision was performed on each ear under local anaesthesia. The process was continued at suprapericondrial plan. By using 4/0 monofilament nonabsorbable suture material, four scaphomastoid sutures were inserted from the posterior aspect of scaphoid fossa to the mastoid periosteum of each prominent ear and tied gently. After control for bleeding, the skin was closed with 5/0 absorbable monofilo'neil suture.*

Results: *Median follow-up was 13.2 months. Complications occurred in both ears. A unilateral haematoma was at one patient's left ear. The haematoma was drained under local anaesthesia and the resuturaing done according to the procedure. A unilateral allergic reaction occurred on the skin sutures of one patient during her first postoperative month and it resolved after taking off the suture material. The mean time of the surgery for each ear was 27.6 minutes (20–40 minutes). The results were satisfactory both for patients and the surgeon.*

Conclusion: *This safe, simple and quick method helps to obtain natural and well-shaped ears. What is more, it does not disturb the external ear canal. No keloid formation and suture exposition were observed with this method, which makes it an effective substitute for other surgical procedures.*

Keywords: Ear deformity, otoplasty, prominent ear

La Sutura Escafomastoidea como Técnica Quirúrgica Alternativa para la Deformidad Auricular Prominente

E Sari

RESUMEN

Antecedentes: *La oreja prominente es un desorden común que afecta las relaciones sociales y la condición fisiológica del paciente. Esta deformidad se puede corregir mediante el uso de varios métodos bien conocidos, que van desde la ferulización temprana hasta la cirugía. Este estudio presenta otro método nuevo y práctico para la corrección de las orejas protuberantes.*

Pacientes y método: *Un total de 40 pacientes (hombre, n = 19; mujeres, n = 21) con 76 orejas prominentes fueron operados mediante la técnica propuesta. La medida concho-mastoidea estuvo entre 2 – 4.5 cm con un promedio de 2.8 cm antes de la cirugía. Siguiendo el método tradicional, se realizó una incisión post-auricular en cada oreja bajo anestesia local. El proceso fue continuado en el plano suprapericondrial. Usando material de sutura no absorbible monofilamento 4/0, cuatro suturas escafomastoideas fueron insertadas desde la cara posterior de la fosa escafoidea al periostio mastoideo de cada oreja prominente, y atadas suavemente. Después de controlar el sangrado, se cerró la piel con una sutura ab-*

From: Department of Plastic, Reconstructive and Aesthetic Surgery, Faculty of Medicine, Kirik-kale University, Kirikkale, Turkey.

Correspondence: Dr E Sari, Department of Plastic, Reconstructive and Aesthetic Surgery, Faculty of Medicine, Kirikkale University, Kirikkale Road, 7th km. 71450, Yahsihan-Kirikkale, Turkey. Fax: +90 580 225 28 19, e-mail: drelifsanli@hotmail.com

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sorbible de monofilamento 5/0.
Resultados: *El seguimiento promedio fue de 13.2 meses. Ocurrieron complicaciones en ambas orejas. Se formó un hematoma unilateral en la oreja izquierda de un paciente. El hematoma fue drenado con anestesia local y la resuturación realizada según el procedimiento. Una reacción alérgica unilateral se produjo en las suturas de la piel de un paciente durante su primer mes postoperatorio, y se resolvió después de sacar el material de sutura. El tiempo medio de la cirugía para cada oreja fue 27.6 minutos (20 – 40). Los resultados fueron satisfactorios tanto para los pacientes como para el cirujano.*
Conclusión: *Este método seguro, simple y rápido, ayuda a obtener orejas naturales y bien formadas. Aún más: no perturba el conducto auditivo externo. No se observó ni formación de queloides ni exposición de sutura con este método, lo que lo convierte en un eficaz sustituto de otros procedimientos quirúrgicos.*

Palabras claves: Deformidad de la oreja, otoplastia, oreja prominente

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INTRODUCTION

Prominent ear, which is a deformity associated with both genders, is characterized by increased cephaloauricular angle and is about 5% of normal births (1). Its' heredity is autosomal dominant and it occurs at the 10th week of intrauterine life (2–6). Although it does not affect the auditory function, the patients or their families suffer from psychological distress and emotional trauma, especially at school. A myriad of surgical procedures have been used for the stated deformity. These procedures can be categorized as cartilage cutting techniques, cartilage sparing techniques and incision-less techniques (7). Regardless of the surgical technique, the treatment intends to correct the deformity eliminating or minimizing the unnatural appearance. The new auricle should have soft contours and normal anatomic beauty. The new helicomastoid distance can be set as 1.2 cm from the superior helix to the scalp, 1.8 cm from mid-helix to scalp, 2.2 cm from lobule to scalp (8). The present study describes a new surgical technique, which is simple, quick and easy to learn.

PATIENTS AND METHODS

A total of 40 consecutive patients (19 males, 21 females; 76 ears) participated in the study for the scaphomastoid suture technique (Table). The patients' ages were between 13 and 40 years, with an average age of 22.9 years. An informed consent form was signed by all participants or their parents. Patients were evaluated before the surgery, and their helicomastoid distance was measured. In addition, blood tests (complete blood count, bleeding parameters and hepatitis tests) were done before surgery. All the cases were operated on by the same surgeon under local anaesthesia. The patients were discharged from hospital on the evening of the surgery.

Table: Clinical details of the patients were demostrated in this table

Patient number	Patient name	Gender*	Age**	C-M distance† Right ear	C-M distance† Left ear	C-M distance† Right ear	C-M distance† Left ear	Follow-up period‡	Otoplasty session	Complication
1	AG	F	16	2.8	2.6	1.8	1.8	24	Primary	None
2	AY	M	16	2.5	2.6	1.5	1.5	24	Primary	None
3	AA	F	30	2.4	2.5	1.5	1.6	18	Primary	None
4	BB	M	17	4	4.2	1.8	1.8	24	Primary	None
5	CA	F	20	2.4	2.6	1.5	1.5	24	Primary	Suture reaction
6	ED	F	30	2.5	2.5	1.5	1.5	15	Primary	None
7	FÜ	M	35	3	Not operated	1.5	Not operated	18	Primary	None
8	GÖ	F	25	Not operated	2.4	Not operated	1.6	24	Primary	None
9	HÇ	F	30	2.4	2.4	1.5	1.5	24	Primary	None
10	MA	F	18	2.7	3.2	1.8	1.8	24	Primary	None
11	ÖK	M	38	2.7	3.4	1.8	1.8	24	Primary	Haematoma
12	PT	F	27	2.6	2.7	1.5	1.5	18	Primary	None
13	RT	F	30	2.6	Not operated	1.5	Not operated	18	Primary	None
14	ZÖ	F	25	2.3	2.4	1.5	1.5	21	Primary	None
15	EÖ	M	30	2.5	2.7	1.5	1.5	18	Primary	None
16	KK	F	32	2.4	2.3	1.5	1.5	15	Primary	None
17	NY	F	18	3.4	3.6	1.8	1.8	15	Primary	None
18	AY	F	20	2.7	2.5	1.8	1.8	16	Primary	None
19	SÇ	M	30	2.5	2.5	1.9	1.9	14	Primary	None
20	AH	M	25	2.9	3	1.9	1.9	12	Primary	None
21	Fİ	M	35	3	3	1.9	1.9	10	Primary	None
22	ST	F	27	3.1	3.4	1.9	2	9	Primary	None
23	HY	F	13	3	3	1.8	1.8	7	Primary	None

24	MO	M	17	3.4	4	2	2	7	Primary	None
25	AP	F	17	3	3	1.5	1.5	6	Primary	None
26	BS	D	F	18	2 2	1.5	1.5	7	Secondary	None
27	BB	F	17	3	3	1.5	1.5	3	Primary	None
28	CV	M	17	2.5	2.5	1.5	1.5	3	Primary	None
29	EA	F	35	2.5	2.5	1.5	1.5	7	Primary	None
30	EK	M	40	3	3	1.5	1.5	9	Primary	None
31	EÖ	M	25	3	3	1.5	1.5	9	Primary	None
32	FE	F	16	Not operated	3.5	Not operated	1.6	9	Primary	None
33	GÖ	F	16	3.5	3.5	1.6	1.6	9	Primary	None
34	GÖ	F	16	3.4	3	1.6	1.6	9	Primary	None
35	MÇ	M	17	4	4	1.7	1.7	3	Primary	None
36	MAÖ	M	15	4.5	4.5	1.6	1.6	3	Primary	None
37	MK	M	17	3.6	3.6	1.8	1.8	9	Primary	None
38	ÖA	M	16	3.4	3.4	1.6	1.6	9	Primary	None
39	ÖK	F	16	3	3	1.5	1.5	3	Primary	None
40	SÜ	F	16	3.5	3.5	1.7	1.7	9	Primary	None

* M = Male, F = Female
** Years
† Centimeter
‡ Months

Surgical technique

After cleaning the auricle and covering the patient with sterile drapes, a piece of sterile gauze was inserted into each external auditory canal orificiums to protect the auditory canal.

Local anaesthesia with a 50% solution of 20 mg/mL lidocaine and 0.0125 mg/mL epinephrine (prepared with saline) was injected to the area between the epicondrium and subcutaneous tissue and observed for hydrodissection and local anaesthesia. An incision was made to the posterior aspect of the auricula and suprapericondrial dissection was performed (Fig. 1a). The needles were inserted through the scaphoid fossa, or the area corresponding to the scaphoid fossa (Figs. 1b−1d).

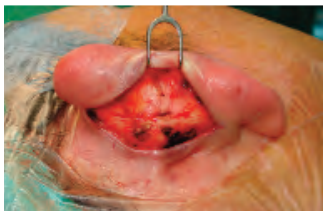

Fig. 1 (a)

Fig. 1 (b)

Fig. 1 (c)

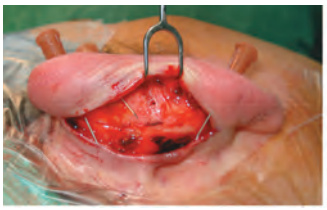

Fig. 1 (d)

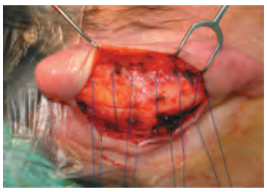

Fig. 1 (e)

Fig.1: (1a) Operation was started with skin incision and suprapericondrial dissection, (1b) To determine the suturation sites, a surgical pen was used to mark four points on the scaphoid fossa or the area corresponding to scaphoid fossa, (1c, 1d). Four needles were passed through those points, (1e). Four scaphomastoid mattress sutures were placed from posterior aspect of scaphoid fossa to mastoid periosteum with 4/0 non-absorbable monofilament suture material.

After control of bleeding, four scaphomastoid mattress sutures were placed from the posterior aspect of scaphoid fossa to the mastoid periosteum with 4/0 non-absorbable monofilamantary suture material (Fig. 1e). No cartilage sparing, cutting, or resection was done in the procedure. After controlling the anterior aspect of the auricle, the sutures were tied gently to prevent over-correction. The helicomastoid distances were measured with a sterile ruler. Then, the skin was sutured with 5/0 absorbable monofilament suture material. Each ear was covered with ointment-impregnated gauze. This was followed by the application of the compression bandages to reduce the oedema and the haematoma risk.

On the first postoperative day, the dressings were replaced by a light headband to avoid epidermal abrasion. The patients were advised to apply ointment once a day. At the end of the third day, the patient was permitted to take a shower with baby shampoo. On the second week, the headband was removed at day time and applied only at night time. After the sixth week, it was removed totally.

RESULTS

Patients were recommended to the doctor at one week, six months and one-year after the discharge. The mean follow-up period was 13.2 months. The median distance between midhelix to the mastoid region was 2.8 cm before the surgery and it was 1.5 cm after the surgery. The mean total operation time for one ear was 27.6 minutes [20–40 minutes] (Figs. 2 and 3). No complication occurred except for one unilateral haematoma and one unilateral suture reaction. In the first case, the haematoma was drained under local anaesthesia and the same surgical procedure was followed according to the author's

technique. In the second case, the mattress sutures were not exposed, but the patient became allergic to the sutures that were inserted into the skin. After removal of the sutures, the reaction was dissolved.

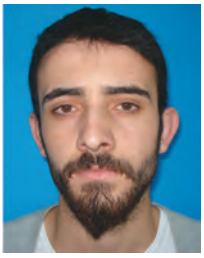
Fig. 2 (a)


Fig. 2 (b)


Fig. 2 (c)


Fig. 2 (d)

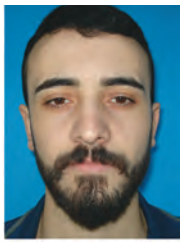
Fig. 2 (e)


Fig. 2 (f)

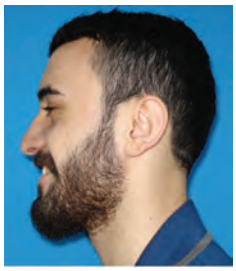
Fig. 2 (g)

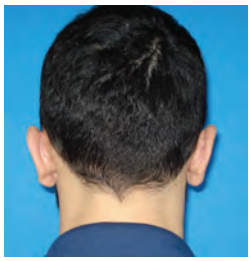
Fig. 2 (h)

Fig. 2: The preoperative and postoperative 12 months images of the patient who was operated with scaphomastoid suture technique (2a: preoperative anterior, 2b: preoperative right lateral, 2c: preoperative left lateral, 2d: preoperative posterior, 2e: postoperative anterior, 2f: postoperative right lateral, 2g: postoperative left lateral, 2h: postoperative posterior figures are displayed).


Fig. 3 (a)


Fig. 3 (b)


Fig. 3 (c)


Fig. 3 (d)

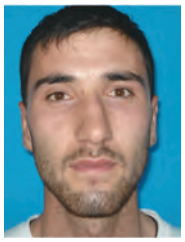
Fig. 3 (e)


Fig. 3 (f)


Fig. 3 (g)


Fig. 3 (h)

Fig. 3: The preoperative and postoperative 12 months images of the patient who was operated with scaphomastoid suture technique (3a: preoperative anterior, 3b: preoperative right lateral, 3c: preoperative left lateral, 3d: preoperative posterior, 3e: postoperative anterior, 3f: postoperative right lateral, 3g: postoperative left lateral, 3h: postoperative posterior figures are displayed).

We did not cut the excessive skin that bulged from the postauricular area. It adhered to the postauricular sulcus with time. Over-correction, under-correction, asymmetry, sharp contours, keloid formation, external auditory canal distortion, skin necrosis and infection were not observed during the follow-up periods. One patient developed a skin reaction to the suture because of the long absorption time of the suture material. Thus, it is advised that sutures that absorb in a shorter period be used or the skin sutures are taken off at the first postoperative week. To conclude, aesthetic results were satisfactory for both the patients and the surgeon according to the postoperative patient satisfaction survey.

DISCUSSION

The auricle is one of the most complex anatomic structures of the body. It has several folds, shapes and diameters which vary from one patient to another. Antihelical fold, conchal bowl, scaphoid fossa and helix are the main anatomic components of the auricle. The prominent ear is usually caused by underdeveloped antihelical fold and/or by conchal hypertrophy (9). Many techniques are commonly used to repair the deformity. Horizontal mattress sutures were first described by Mustarde for reshaping the antihelical fold (10). Cartilage sparing techniques were performed for this purpose, but the risk of the recurrence was high because of the cartilage memory (11). Kaye

unified the mattress sutures with anterior scoring technique. However, infection and anterior skin necrosis are the most feared complications of the anterior scoring procedure (12, 13). Cartilage cutting and suturing techniques may be used to correct the antihelical fold, but sharp edges after the procedure are an unfavourable result (14). A conchal resection is another method to use for an oversized concha. However, cartilage framework may weaken, which is a disadvantage of this method (15, 16).

The scaphomastoid suture technique is an alternative technique that creates a natural anatomic auricle shape. This procedure allows the creation of the new antihelical fold and the new conchomastoid angle with one type of suture (Fig. 4).

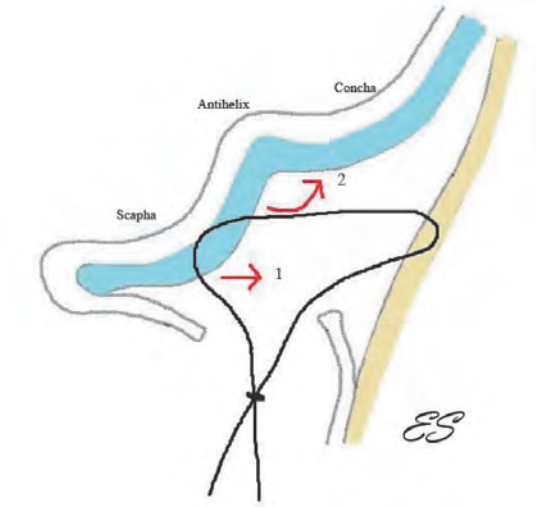

Fig. 4: The axial view of scaphomastoid suture technique is presented. The red signs correspond to the movement of the cartilage frame. The *number 1* movement creates the new shape of the antihelical fold; the *number 2* movement forms the new distance of helicomastoid and concomastoid angle.

Depending on the locations of the transition sutures, the helix's position can be modified by the surgeon. Thus, conchomastoid [Mustarde] (10) or scaphoconchal [Furnas] (17) sutures are not needed separately. Suprapericondrial dissection is another advantage of the technique. It enables the surgeon to do the surgery quickly (the average time of the total procedure is 27.6 minutes per each ear) and prevents cartilage damage. Moreover, suprapericondrial dissection is very useful in secondary otoplasty cases which contain scarred pericondrium. Limited dissection reduces the risk of haematoma formation. This is not a cartilage cutting or cartilage sparing technique, so skin necrosis, cartilage destruction, cartilage irregularities, or recurrence risks are lower than the other techniques.

In the present study, the cartilage suturing technique proved successful as no recurrence was observed in the late postoperative period. Although non-absorbable suture material was used for scaphomastoid mattress sutures, no suture exposure or allergic suture reaction was observed. The method does not include cartilage resection or sliding. Despite this, aesthetic results in large cartilages were satisfactory and the contours were soft. Additionally, the infection or skin necrosis was not regarded as a complication of this procedure. Furthermore, the proposed technique does not weaken the cartilage framework, and the day-time headband application period is reasonable for the patients. After all, wearing the bandage at night was not reported being uncomfortable by any patient.

Besides all these advantages, however, our technique had a limitation. In the first postoperative week, the auricles seem to have sharp contours for patient and the surgeon. It should be noted that the cartilage edges will become softer at the end of the first month. Finally, the procedure does not involve the lobule correction. That is why we include another technique in our operation for the lobule correction in severe prominency.

CONCLUSION

The scaphomastoid suture technique has proven effective in significant ways. With this technique, the operated prominent ear is aesthetic and natural with no apparent signs of the surgery. It is quick to perform, and easy to apply and learn, with minimal complications or recurrences. Nevertheless, the procedure does not cover severe prominent lobules. An extra procedure choice for lobule correction should be performed in severe cases for this reason.

ACKNOWLEDGEMENT

The author has no conflict of interest to declare.

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