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The Embedded U-Suture Technique for Better Cosmetic View in Patients Underwent Endoscopic Thoracic Sympathectomy

Endoskopik Torasik Sempatektomi Uygulanan Hastalarda Daha İyi Kozmetik Görünüm İçin Gömülü U-Sütür Tekniği

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ABSTRACT

In endoscopic thoracic sympathectomy (ETS) surgery, a chest drain is inserted into the pleural space after the procedure for lung expansion and is quickly removed after lung hyperinflation. A horizontal mattress suture, also named U-suture, is quickly knotted around the chest drain to prevent air from entering the pleural space. The U-suture may cause poor cosmetic appearance because of excessive scar tissue development. In this study, we aimed to investigate the new embedded U-suture technique using polyglactin suture, which is an absorbable material, and its cosmetic results. In this retrospective study, we collected data on patients who underwent ETS performed with a new technique. A total of 30 patients were included in the study. Neither serious wound complications nor excessive scar formation was observed in the follow-ups of the patients. The embedded U-suture technique in ETS surgery has some advantages such as good cosmetic results, no need for the removal of sutures, and applicability in both genders.

Keywords: Endoscopic thoracic sympathectomy, hyperhidrosis, uniportal, VATS, sympathectomy

ÖZ

Endoskopik torasik sempatektomi (ETS) ameliyatında, işlemden sonra akciğer ekspansiyonu sağlamak için plevral boşluğa göğüs dreni yerleştirilir ve akciğer hiperinflasyonundan sonra hızla çıkarılır. Plevral boşluğa hava girmesini önlemek için horizontal matress sütür, U sütür olarak da adlandırılır, göğüs dreni etrafına hızla düğümlenir. U sütür, aşırı skar dokusu gelişimi nedeniyle kötü kozmetik görünüme neden olabilir. Bu çalışmada, emilebilir bir materyal olan poliglaktin sütür kullanılarak yapılan yeni gömülü U sütür tekniğini ve kozmetik sonuçlarını araştırmayı amaçladık. Bu retrospektif çalışmada, yeni bir teknikle ETS uygulanan hastalara ait verileri topladık. Çalışmaya toplam 30 hasta dahil edildi. Hastaların takiplerinde ciddi yara komplikasyonları veya aşırı skar oluşumu gözlenmedi. ETS ameliyatında gömülü U sütür tekniğinin iyi kozmetik sonuçlar, dikiş alınmasına gerek olmaması ve her iki cinsiyette de uygulanabilirlik gibi bazı avantajları vardır

Anahtar Sözcükler: Endoskopik torasik sempatektomi, hiperhidrozis, uniportal, VATS, sempatektomi

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INTRODUCTION

Endoscopic thoracic sympathectomy (ETS) surgery, defined for various indications, is often applied to primary focal hyperhidrosis and facial blushing. Today, in parallel to advances in minimally invasive surgery, the ETS procedure is performed successfully with video-thoracoscopic single port technique, in many centers. Ipsilateral lung collapse is technically created through double lumen intubation, and sympathetic blockade is performed through sympathectomy or nerve clipping at the appropriate level according to the indication of ETS (1). Also, some modifications such as single lumen intubation and apneic periods, intrapleural CO_2 insufflation, or awake video-assisted thoracic surgery (VATS) were reported in various publications (2-3). Ipsilateral tube thoracostomy and underwater seal drainage are performed after the sympathetic interruption and are removed after lung re-expansion with hyperinflation, by the anesthetist. A U-suture, which was previously placed around the chest drain, is quickly tied while the tube is removed to prevent pneumothorax due to intrapleural negative pressure. In the conventional technique, the U-suture is thrown over the skin and knotted after tube removal (Figure 1a). This technique may lead to poor cosmetic appearance due to both suture marks and possible scar tissue suture technique in long-term follow-ups (Figure 1b). In this study, we aimed to describe the intramuscular embedded U-suture technique and its cosmetic results in patients who underwent ETS surgery.

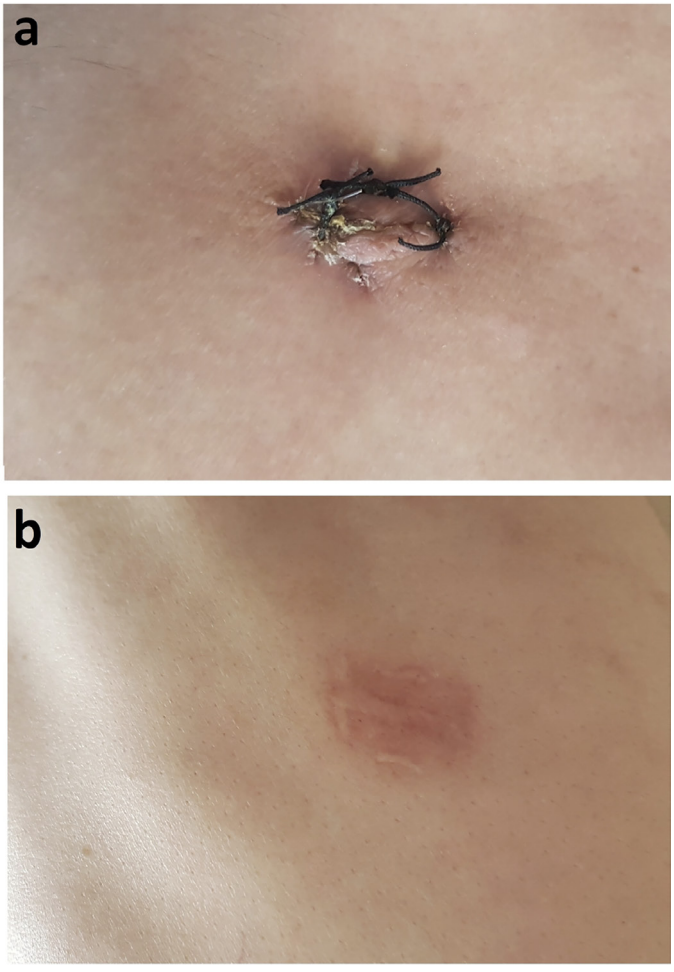

Figure 1. a) Figure shows closure of port incision with silk suture material and conventional horizontal mattress (U-suture) technique. **b)** Poor cosmetic results due to scar tissue can occur in long-term follow-ups in the conventional method

CASE REPORT

Surgical Technique

Patients are placed in the Semi-Fowler position after the double lumen intubation. A skin incision of about 1 centimeter in length is made at the axillary region. The serratus anterior, intercostal muscles, and parietal pleura layers were passed after ipsilateral lung collapse, and the hemithorax was entered through the 3rd intercostal space. The thorax is explored with a 5 mm 30-degree optic, and instruments such as a hook, clip applier, or energy devices are inserted into the thorax adjacent to the optic. After providing sympathetic blockage at the appropriate level according to indication of ETS, a chest drain is inserted into the thoracic cavity through the same hole, and connected to the underwater drainage. A U-suture is placed in the muscle fibers surrounding the chest drain with a 2-0 round polyglactin suture material (Figure 2a). Ipsilateral lung hyperinflation is performed by the anesthesiologist, and the surgeon observes the air leakage. When air leak stops, the chest drain is removed and U-suture is knotted as quickly as possible to prevent the pneumothorax (Figure 2b). The skin layers are closed subcuticular with an absorbable monofilament suture material (Figure 2c and Figure 2d). The scar is minimal, and the cosmetic appearance is satisfactory in this technique (Figure 3). After the approval of the local ethics committee, the records of patients who underwent ETS surgery with the embedded U-suture technique between January 2019 and April 2022 were retrospectively reviewed. Data on the patients such as age, gender, hyperhidrosis areas, presence of postoperative complications, and wound site problems were collected. A total of 30 patients were included in the study. The median age was 23 (16-44) years. The clinicopathologic characteristics of patients were given in the table (Table 1). All patients included in the study underwent bilateral ETS. The most common sympathectomy level was R3-4 for primary palmar hyperhidrosis in 19 patients (63%). The most common postoperative complication was chest pain, which improved with non-steroidal anti-inflammatory drugs, occurring in 21 patients (70%). Unilateral minimal pneumothorax was detected in 3 patients (10%), and bilateral minimal pneumothorax in only one patient (3.3%). Tube thoracostomy was not required in any of the patients. Neither serious wound complications nor excessive scar formation were observed in the follow-ups of the patients.

We aimed to present a new embedded U-suture technique and its cosmetic advantages in this study. U-suture, used in conventional methods, has some disadvantages. It has a bad cosmetic appearance, can cause excessive scar tissue, and needs to be removed again. Various physicians conducted studies to prevent poor cosmetic appearance, due to VATS incision. Kim defined a subcutaneous suture technique in patients undergoing uniportal VATS performed for pneumothorax (4). Kesler et al. (5) reported a peri areolar incision technique for good cosmetic results in patients who underwent ETS surgery. Although good cosmetic results were reported in this peri areolar technique, its undesirable feature is that it cannot be applied in female patients. Chen et al. (6) demonstrated advantages of

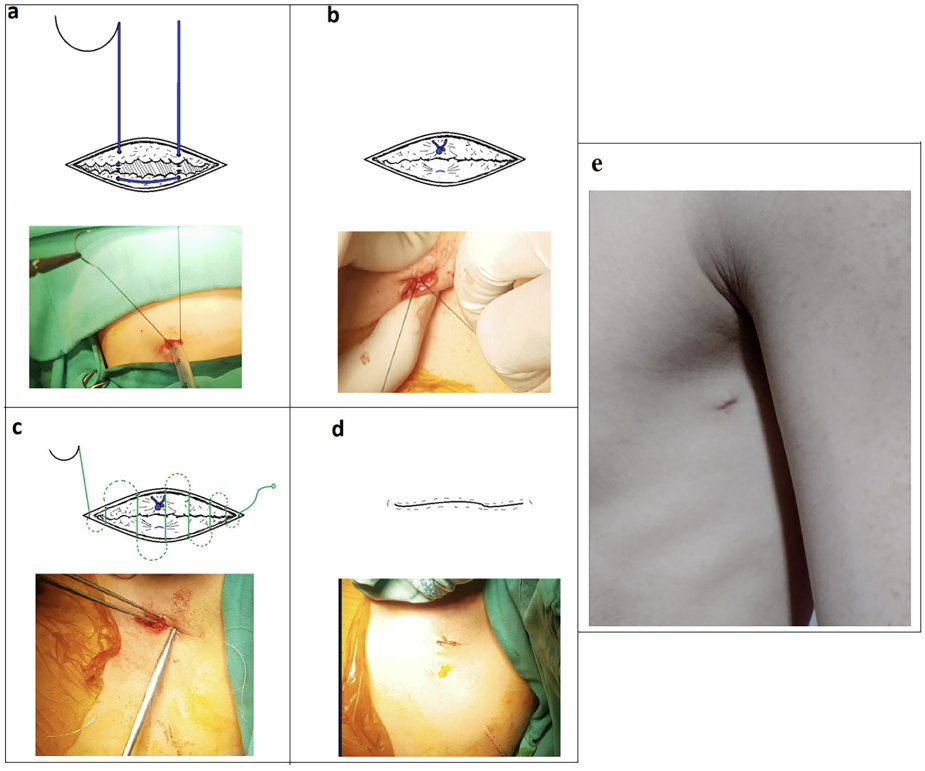

Figure 2. a) A U-suture (2-0, round, polyglactin) is placed in the muscle fibers surrounding the chest drain. **b)** U-suture is knotted after removing the chest drain. **c)** The skin layers are closed subcuticular with an absorbable monofilament suture material. **d)** Figure shows post closure view of port access incision. **e)** In long-term follow-ups, better cosmetic appearance can be obtained with the new embedded U-suture technique than with previous methods

Table 1. Characteristics of patients included in the study, n=30

		n	%
Age, median (range)	23 (16-44) years		
LOS, median (range)	1 (1-3) days		
Gender			
	Female	16	53.3
	Male	14	46.7
Hyperhidrosis area and symphaticotomy level			
	Palmar/R3-4	19	63.3
	Axillary/R4-5	2	6.7
	Craniofacial hyperhidrosis & blushing/R3-4-5	2	6.7
	Palmar and axillary	6	20
	Craniofacial and palmar / R2-3-4	1	3.3
Postoperative complication			
	Chest pain	21	70
	Dyspnea	12	40
	Pneumothorax (unilateral)	3	10
	Pneumothorax (bilateral)	1	3.3

LOS: Length of stay, SD: Standard deviation

needlescopic periareolar ETS technique in a prospective randomized study, but it is applicable only to male patients. However, the embedded U-suture technique described in this article applies to both genders and yields good cosmetic results. This study was approved by the Gazi University Ethics Committee (approval number: 2022-915, date: 26.07.2022). Informed consent regarding publication were obtained from the patients.

CONCLUSION

As a result, the embedded U-suture technique in ETS surgery has some advantages such as good cosmetic results, no need to remove sutures, and applicability in both genders. Additionally, a significantly increased risk of pneumothorax is not expected in this technique.

Ethics

Ethics Committee Approval: This study was approved by the Gazi University Ethics Committee (approval number: 2022-915, date: 26.07.2022).

Informed Consent: Informed consent regarding publication were obtained from the patients.

Footnotes

Authorship Contributions

Surgical and Medical Practices: M.S., I.A., M.T.A., A.K., G.A., A.Ç., Concept: M.S., I.A., M.T.A., A.K., G.A., A.Ç., Design: M.S., I.A., M.T.A., A.K., G.A., A.Ç., Supervision: M.S., I.A., M.T.A., Material: M.S., A.Ç.,

Data Collection or Processing: M.S., I.A., M.T.A., Analysis or Interpretation: M.S., I.A., M.T.A., A.K., G.A., A.Ç., Literature Search: M.S., I.A., M.T.A., Writing: M.S., I.A., M.T.A., A.K., G.A., A.Ç., Critical Review: M.S., I.A., M.T.A., A.K., G.A., A.Ç.

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