



# The Use of Fascia Lata in the Reconstruction of Chest Wall Defects: Is It Effective

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**Abstract:** *Introduction:* Chest wall defects could be encountered after chest wall resection for chest wall tumors or resection of pleural or pulmonary tumors invading chest wall. Moreover, they could result from chest trauma. Chest wall reconstruction can be difficult and challenging for the thoracic surgeon. Different techniques and materials were introduced to carry out reconstruction of chest wall defects. Synthetic materials have been associated with some disadvantages. Fascia lata harvested from the thigh of the patient could replace the synthetic materials for chest wall reconstruction therefore avoiding their disadvantages. *Aim:* The aim of this study was to determine the efficacy and outcome of the use of fascia lata in the reconstruction of chest wall defects. *Patients and methods:* Retrospective revision of the files of the patients who underwent chest wall reconstruction for chest wall defects using fascia lata at Cardiothoracic Surgery Department at Alexandria University, Egypt during the period (January 2003- December 2008) was done. *Results:* Ninety patients (13 males and 6 females) underwent chest wall reconstruction of chest wall defects using fascia lata. Age ranged between 22-75 ( $49.7 \pm 13.7$ ) years. The diameter of chest wall defects was between 5-17 cm. The time range for harvesting fascia lata was 14-20 ( $15.8 \pm 2.6$ ) minutes. Average of postoperative hospital stay was  $12 \pm 13.1$  days. The complication that was encountered at site of harvesting of fascia lata was seroma formation that needed to be aspirated (10.5%). Stability was achieved in 78.9% of patients while small segment of paradoxical movement were encountered in 21.1%. *Conclusion:* In conclusion, reconstruction of chest wall defects using free graft of fascia lata was found to be safe with low rate of complications. It avoids the risk of infection that encountered with the use of synthetic materials. The stability provided to the chest wall after reconstruction with fascia lata was found to be dependent on the size and site of the chest wall defect. Moreover, it was found that fascia lata could provide acceptable stability for reconstructed chest wall defects that is more pronounced few weeks later following surgery.

**Keywords:** Fascia Lata, Chest Wall Defects, Chest Wall Reconstruction

## 1. Introduction

Chest wall defects can result from resection of chest wall tumors or can be due to severe chest trauma. Chest wall reconstruction following chest wall resection constitutes a special surgical challenge because of two basic considerations: the anatomical defect and the physiological deficit. Generally, large defect should be reconstructed to provide a structural stability and to prevent flail chest (1). Prosthetic materials are readily available and they can provide rigid chest wall reconstruction. Consequently, their use is preferred in many cases (2, 3). The first use of fascia lata graft for skeletal chest wall reconstruction was documented in 1947 (4). Nowadays, the use of fascia lata is infrequent in the repair of chest wall defects. Meanwhile, it

was observed that autologous fascia lata grafts are still used in various reconstructive surgeries including neuro-surgery, abdominal surgery and others (5-8). The objective of this study is to determine the efficacy and the outcome of the use of fascia lata in the reconstruction of chest wall defects.

## 2. Patients and Methods

Retrospective revision of the files of the patients who underwent chest wall reconstruction for chest wall defects using fascia lata at Cardiothoracic Surgery Department, University of Alexandria, during the period (January 2003- December 2008) was performed. Data included the demographic information of the patients, clinical presentation, technique and time of harvesting of fascia lata, largest

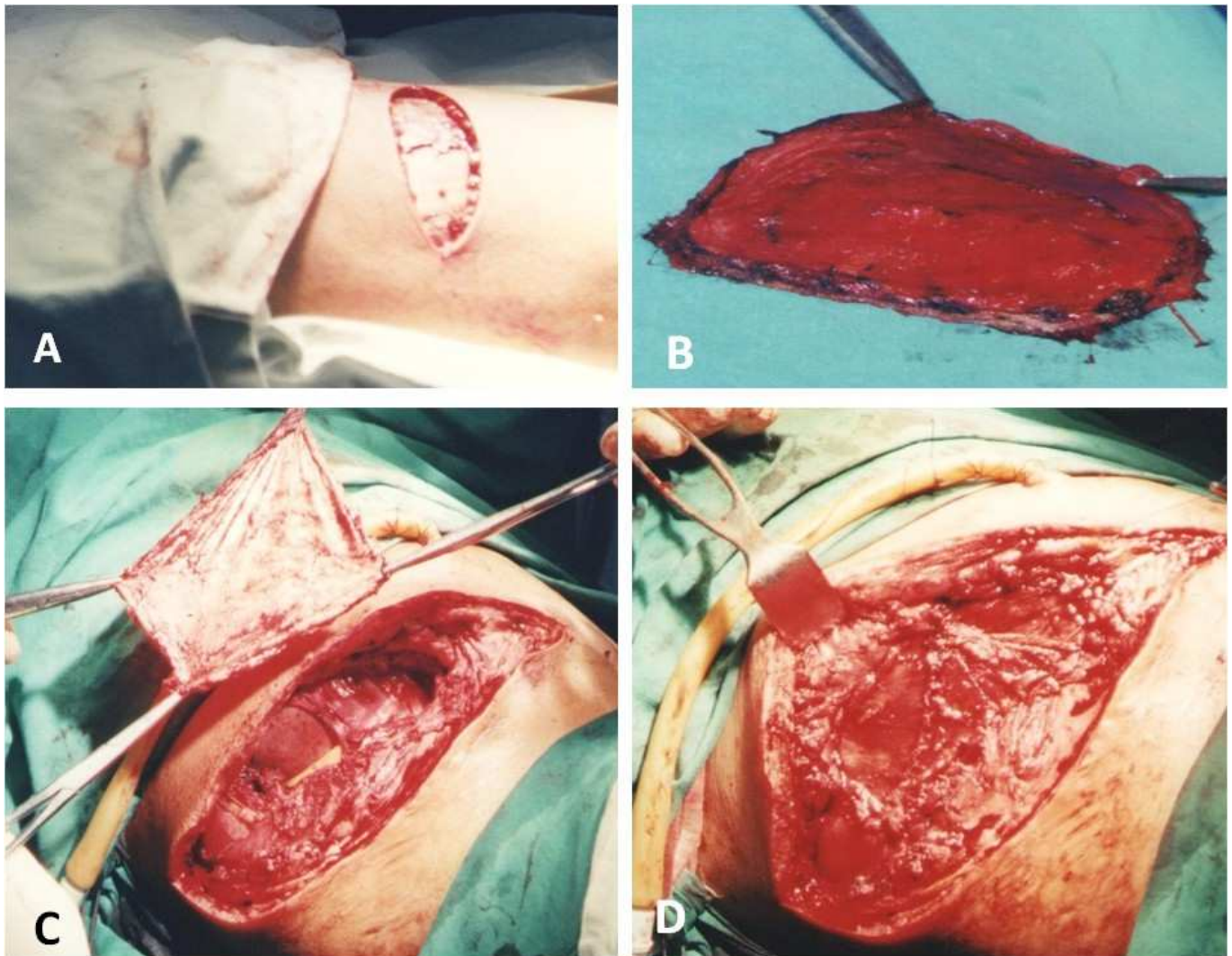
diameter and the site of chest wall defect, and the period of postoperative hospital stay.

*Technique of fascia lata harvesting (Fig. 1):*

Patient was positioned in the lateral decubitus. Thoracotomy and site of the harvesting of fascia lata at the lateral thigh were both disinfected and prepped. Mid- thigh horizontal incision was performed. Dissection of upper and lower skin flaps was performed. Then, harvesting of fascia lata was then accomplished. Direct closure of the wound was done without insertion of drain. Reconstruction of the chest wall defect was consequently performed using the fascia lata. At the end of the operation, the site of the harvesting of fascia lata was bandaged to prevent seroma formation.

### 3. Results

This study included nineteen patients (13 males and 6 females) who underwent chest wall reconstruction for chest wall defects using fascia lata. The age ranged between 22-75 years old with a mean of  $49.7 \pm 13.7$  years. Presenting symptoms varies. The most common presenting symptom was combined chest wall swelling and chest pain in twelve patients. One patient presented with chest wall pain and another one with chest wall sinus. Two patients had chest wall defect following chest trauma. Chest wall swelling without associated pain was encountered only in three patients.



**Fig. 1.** A) Mid-thigh lateral incision for harvesting fascia lata, B) Autologous free fascia lata graft after harvesting, C) Adjusting fascia lata on the chest wall defect, D) Chest wall defect reconstructed with autologous free graft of fascia lata.

The smallest diameter of chest wall defect was 5 cm while the largest diameter was 17 cm. The time range for harvesting fascia lata was 14-20 ( $15.8 \pm 2.6$ ) minutes. Average of postoperative hospital stay was  $12 \pm 13.1$  days. Site of the defect varied. Six patients had chest wall defect located on the right lower part of the chest while it was located at right upper part of the chest in other six patients.

Two of those patients had the defects located in the anterior chest wall. In the remaining seven patients, the defect was located in the left lower part of the chest in four patients while it was found at the left upper chest in three patients. In those three patients two had the defect located anteriorly. The complication that was encountered at site of harvesting of fascia lata was seroma formation that needed to be aspirated

(10.5%). Stability was achieved in 78.9% of patients while 21.1% (Table 1).  
small segment of paradoxical movement were encountered in

**Table 1.** Demographic data for the patients.

No.	Sex	Age	c/o	Largest diameter Of defect (cm)	POHS	Stability	Harvesting time (min)	Site of defect
1	M	75	P + s	5	14	Y	20	RT-LO-PO
2	M	65	S	8	8	Y	20	RT-U-PO
3	M	60	S	14	10	F	20	LF-LO-L
4	F	50	S	14	11	F	20	LF-LO-L
5	M	60	P	10	11	Y	20	RT-U-PO
6	F	22	P + S	5	2	Y	14	LF-U-ANT
7	M	40	P + S	10	10	F	14	LF-U-ANT
8	F	53	P + S	13	10	F	14	LF-LO-ANT
9	M	30	TD	16	57	Y	15	RT-LO-L
10	M	27	CWS	10	37	Y	15	RT-LO-ANT
11	M	55	P + S	17	5	Y	15	RT-U-PO
12	F	45	P + S	8	5	Y	14	RT-U-L
13	M	50	P + S	5	5	Y	14	LF-U-PO
14	M	55	P + S	5	5	Y	14	LF-LO-PO
15	F	60	P + S	6	5	Y	15	RT-LO-PO
16	M	35	TD	6	7	Y	14	RT-LO-L
17	M	48	P + S	5	6	Y	14	RT-U-PO
18	F	55	P + S	10	10	Y	15	RT-LO-L
19	M	60	P + S	8	10	Y	14	RT- U-ANT

M = Male, F = Female, C/O = complaint, cm = Centimeter, POHS = Postoperative Hospital Stay, Min = minute, P+S = Pain & Swelling, S = Swelling, TD = Traumatic defect, CWS = Chest wall sinus, Y = yes, F = flail segment, RT = Right, LO = Lower, PO = Posterior, LF = Left, L = lateral, U = Upper, ANT = Anterior

## 4. Discussion

Chest wall reconstruction with synthetic materials is well known and is performed by many surgeons all over the world (1). The use of a Marlex mesh was first described in 1960 (9). However, prosthetic materials have the disadvantage that it can become a focus for infection or can cause aseptic inflammation (1, 10). Infection was reported in 4.6% of patients and seroma was detected in 7.1% in one series of chest wall reconstructions using prosthetic materials (2). In this study, autologous fascia lata was not found to be associated with infection or rejection. This was reported by Murakawa *et al.* (1). In addition, it is found that use of fascia lata graft in chest wall reconstruction is cost saving. Fascia lata graft was easy to harvest. Time of harvesting ranged from 14-20 minutes. Actually, time of harvesting was started with 20 minutes and then reached to 14 minutes. The diameter of chest wall defect ranged from 5 up to 17 cm. Surgeons were capable to reconstruct the defect with autologous fascia lata. The reconstructed chest wall was sufficiently stable in most of the patients. Paradoxical movement of the chest wall have been found in small segments of the part reconstructed in four patients. These small segments of paradoxical movement were mostly encountered with reconstruction of defects that are located on the upper and anterior of the chest wall. Complications were encountered in one patient in the form of seroma formation at site of the fascia lata harvesting. This seroma had to be aspirated under aseptic technique. The only disadvantage of using this graft is the creation of a second wound.

## 5. Conclusion

In conclusion, reconstruction of chest wall defects using free graft of fascia lata was found to be safe with low rate of complications. It avoids the risk of infection that encountered with the use of synthetic materials. The stability provided to the chest wall after reconstruction with fascia lata was found to be dependent on the size and site of the chest wall defect. Moreover, it was found that fascia lata could provide acceptable stability for reconstructed chest wall defects that is more pronounced few weeks later following surgery.

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