

Endoscopic Nipple-Sparing Mastectomy with Immediate Prepectoral Implant-Based Reconstruction: A Case Report

Authors' Contribution:
Study Design A
Data Collection B
Statistical Analysis C
Data Interpretation D
Manuscript Preparation E
Literature Search F
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Conflict of interest: None declared

Patient: Female, 45-year-old
Final Diagnosis: Prophylactic mastectomy
Symptoms: —
Medication: —
Clinical Procedure: —
Specialty: Obstetrics and Gynecology





Objective: Unusual setting of medical care
Background: Technical innovations allow endoscopic nipple-sparing mastectomy (NSM), which is well tolerated and associated with greater patient satisfaction. Endoscopic technique did not have wide diffusion; many centers have abandoned this technique because of technical challenges. Implant-based reconstruction (IBR) remains the most common form of breast reconstruction. Current techniques involve partial or total coverage of the implant with pectoralis major muscle to prevent exposure or infection. Muscle dissection has functional and cosmetic consequences.

Case Report: We present a case of 45-year-old patient presenting with personal history of right breast cancer. The patient requested left prophylactic mastectomy. We used a 4 cm-long single hidden scar on axillary line. Endoscopic nipple-sparing mastectomy was done using a single port with 3 sleeves. Immediate breast reconstruction was performed by inserting a silicon implant in prepectoral plane without Acellular Dermal Matrix (ADM). At 6 months postoperatively, no complication had been reported. The patient was satisfied with the result and no further correction was necessary.

Conclusions: Endoscopic surgery is a valuable option for nipple-sparing mastectomy. This method is a less expensive alternative technique to robotic approach. It could enable safe prepectoral IBR without placement of ADM and with lower risk of complications.

MeSH Keywords: Adenocarcinoma • Breast Implantation • Endoscopy • Mammoplasty • Mastectomy, Subcutaneous

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Background

Prophylactic mastectomy provides greatest reduction in risk of breast cancer development in BRCA population. Choosing prophylactic mastectomy is a major decision for women and surgical esthetic outcome is an important patient consideration. Implanted-based immediate breast reconstruction (IBR) following skin- or nipple-sparing mastectomy optimizes cosmetics and is associated with high patient satisfaction and good psychological adjustment [1–6].

Placement of prosthetic implants has been subject of discussion. Breast implants were first placed in prepectoral plane. This technique was abandoned due to high incidence of infection, capsular contracture, and explantation. Sub muscular implant placement was adopted but has been associated with a number of complications including pain, functional impairment, unnatural appearing breast [7,8].

Prepectoral prosthetic breast reconstruction has gained popularity with emergence of Acellular Dermal Matrix (ADM) but remains controversial [8–12].

Endoscopic NSM (eNSM) is associated with greater patient satisfaction but was not widely disseminated because of time-consuming learning curve and technical difficulties [13]. Moreover, most of incisions used are visible and considered as unaesthetic by patients. Robotics offer interesting prospects for improving visibility and increasing maneuverability, allowing movement of the incision to the axillary area and limiting subcutaneous dissection in the breast area, which has adverse effects on cutaneous vascularization [14–18]. But this is a highly specialized, expensive and largely unavailable technique.

Endoscopic technique with axillary incision could be a great solution for NSM and enable safe prepectoral implant placement without adjunction of ADM. This article describes surgical technique and postoperative outcome of our first case of eNSM associated with IBR.

Case Report

We report the case of 45-year-old patient presenting with personal history of breast cancer. She underwent a right mastectomy with delayed reconstruction using latissimus dorsi flap with implant. The patient requested left prophylactic mastectomy. Clinical examination, mammography and breast magnetic resonance imaging did not show abnormalities. Her breast cup-size was B-cup.

Preoperative markings were made with patient in standing position. Skin incision was marked in axillary line, 5 cm posterior

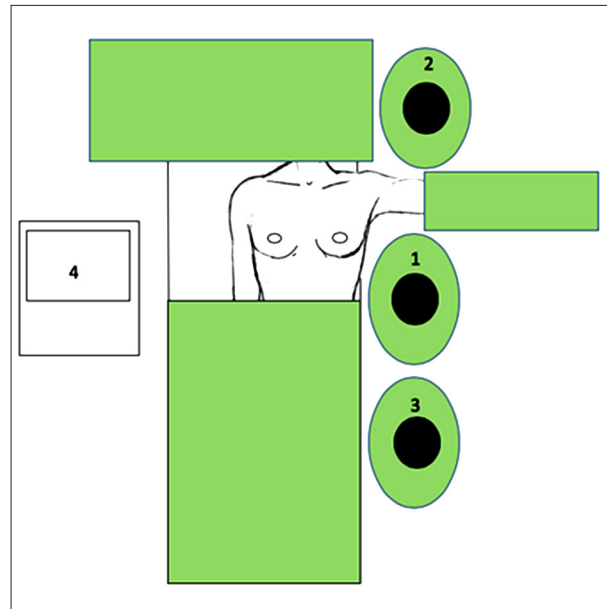


Figure 1. Installation of patient, medical team, and surgical material: patient is placed on the edge of table, ipsilateral arm abducted to 90°; surgeon (1) and instrumentalist (3) on the left of patient's arm and assistant on the right (2). Coelioscopic endoscope is placed in front of the surgeon (4).

to lateral border of the gland which resulted in invisible scar with arms alongside the body.

Intervention was performed under general anesthesia. Patient was placed in supine position, with ipsilateral arm abducted to 90° (Figure 1).

A 4 cm long incision was made as previously described. Adrenalin was infiltrated from external breast segments, as far as possible to internal segments. After subcutaneous dissection over an area of few centimeters, single port with 3 sleeves was inserted (Figure 2). It was connected to an insufflator to keep pressure at 8–10 mmHg. Surgery was performed using 10-mm-diameter straight 0° rigid endoscope. Dissection was performed with fenestrated bipolar forceps and monopolar scissors. Traction, exposure and bipolar cauterization was carried out using Karl Storz Robi® bipolar forceps in the left sleeve.

Mastectomy began with subcutaneous dissection in lateral to medial direction and was completed with gland separation from deep fascia, just on pectoralis major muscle. Gland was extracted through axillary skin incision. Following irrigation and hemostasis of the mastectomy pocket, a drain was placed in surgical site. Immediate breast reconstruction was performed by inserting a silicon implant in prepectoral plane without ADM. Incision was closed hermetically in three planes (Figure 3). Operative time was 160 minutes. Patient left hospital on day 4 after surgery.

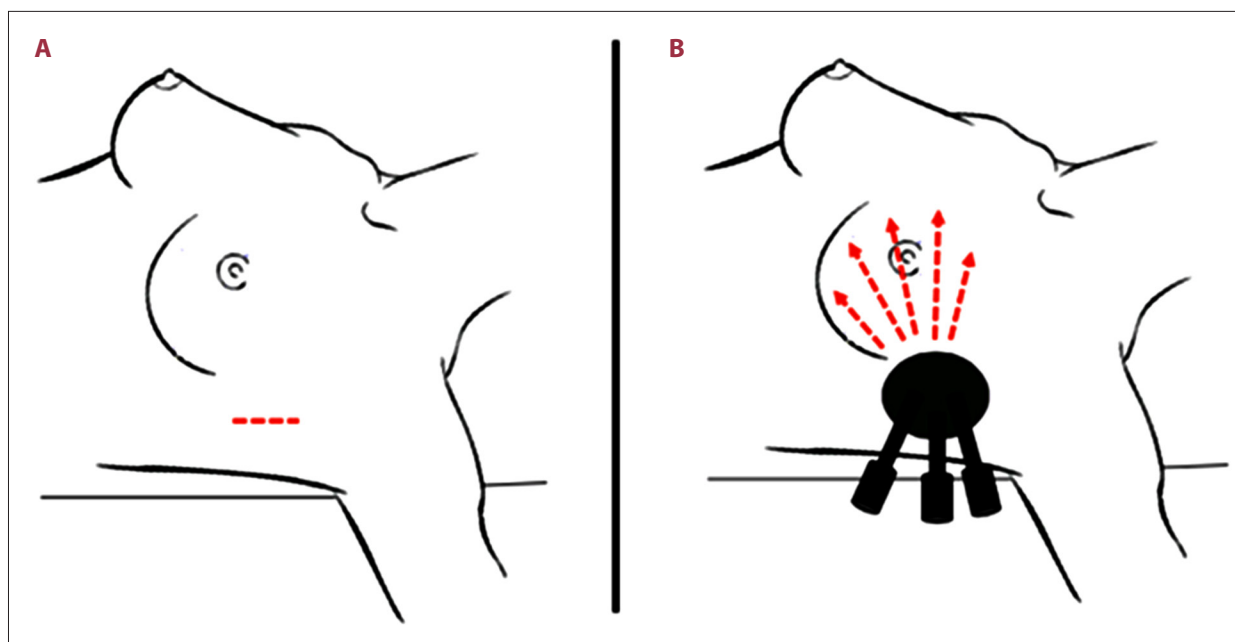


Figure 2. Incision (red line; **A**): 5 cm posterior to lateral border of the gland which resulted in invisible scar with arms alongside the body. After subcutaneous dissection over an area of few centimeters, single port with 3 sleeves is inserted (**B**): 1 sleeve for bipolar forceps, 1 for scissors, and the last for video camera. Subcutaneous dissection and gland separation from deep fascia are done in lateral to medial direction (red arrows).



Figure 3. Intraoperative view of the patient after immediate breast reconstruction and suture of axillary incision.

At 6 months postoperatively, no complication had been reported. The patient was satisfied with the result and no further correction was necessary (Figure 4).

Discussion

Mastectomy is associated with increased incidence of psychological disturbances which have been minimized by IBR. With advances in minimally invasive endoscopic techniques, patients

can have mastectomy and IBR done with endoscopic assistance to minimize skin incision and improve cosmetic outcome.

An eNSM should be less traumatic than conventional techniques. The use of forceps is limited, insufflation leading to a dissection plane between the skin and the breast tissue. Complications commonly observed following open breast surgery; in particular seroma formations, hematoma, infection, and prosthesis-related complications are less frequently encountered following eNSM [19,20]. But others are more frequently observed following ESM and include skin and muscle flap necrosis, and necrosis of the nipple areolar complex. These complications could be related to the learning curve and/or limitations of current endoscopic instruments, influenced by training and technological advances respectively [19]. Kitamura et al. suggest that eNSM may be associated with greater intra-operative blood loss than open breast surgery [20].

In conventional techniques, NSM can be done using a small incision hidden in the inframammary line with good results. This incision is not appropriate for eNSM and would lead to limited range of motion, instruments tripping over the chest wall. With the axillary incision technique, the patient is placed on the edge of the table, offering the optimal maneuverability of endoscopic instrumentation. Moreover, a scar in the lower part of the breast would be located directly adjacent to the implant pocket. In case of healing complications, it could lead to implant exposure.



Figure 4. Pre (A) and postoperative view (B) of the patient.

The eNSM was not significantly adopted in clinical practice because of technical difficulties and slow learning curve [13]. Most of these methods involved 3 incisions which remained visible following surgery [13–18,21–23]. In 2014, Tukenmez et al. described single-port technique but involved a visible scar and sub-pectoral plane IBR [24].

Toesca et al. developed a surgical approach using Da Vinci Surgical System® with small hidden axillary scar (2.5 cm length) and immediate breast reconstruction [17]. In 2017, they described the outcome of the first 29 procedures which resulted in 7% conversion rate to traditional open surgery [18]. Sarfati et al. used same surgical approach with three hidden incisions [14]. Despite encouraging results, this technique has limitations such as limited access and operating costs.

We described an endoscopic technique with single hidden incision which allows complete NSM and IBR. Position of incision should reduce the risk of complications especially implant extrusion, the scar being distant from implant site. Under endoscopic vision, meticulous dissection with lower skin traumatism and hemostasis can be achieved. Moreover, eNSM could represent a less expensive and more available alternative to robotic approach.

In this report, silicone implant was inserted in prepectoral plane. Several advancements in both mastectomy and reconstructive techniques allow safe, efficacious subcutaneous implant placement. This technique offers muscle preservation, superior breast shape and less pain [10,25].

Operating time was longer than traditional procedure. Learning curve should be rapid given easy use of surgical instruments and frequency of such surgical procedure.

Conclusions

We describe a technique of eNSM and IBR with single hidden axillary incision. This method is a less expensive alternative technique to robotic approach. It could enable safe prepectoral IBR without placement of ADM and with lower risk of complications. This technique is perfectly indicated in patients without breast surgical history for prophylactic mastectomy or NSM for extensive ductal carcinoma *in situ*. In case of history of breast conservative surgery, mastectomy should be done through previous scars. In the event of history of thoracic radiotherapy or postoperative radiotherapy, this technique is not proposed. eNSM is not appropriate for patients with large breast volume (cup size >C): esthetic outcomes won't be optimal with large prepectoral breast implants. When additional mammoplasty is needed (breast ptosis, mammary hypertrophy), eNSM should not be proposed. A prospective study should be initiated to assess the role of this original approach in therapeutic arsenal for breast reconstructive surgery.

Conflicts of interest

None.

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