

# Outcomes of Immediate Pre-pectoral Implant-Based Breast Reconstruction with Acellular Dermal Matrix

EM Quinn, L Highton, R Johnson, J Murphy

Manchester University NHS Foundation Trust, Manchester, UK

Abstract ID: 787397 Email: edelquinn@rcsi.ie



## Background

Implant-based breast reconstruction techniques have evolved over the years from the two-stage total submuscular, to partial muscular coverage with mesh, to recent pre-pectoral/total mesh coverage procedures (Figure 1).



Figure 1: The evolution of implant-based breast reconstruction

The benefits associated with the pre-pectoral approach include:

- Quicker recovery
- Less pain
- No animation
- No chronic muscle fatigue/ache
- No loss of muscle/shoulder function

However, no randomised data exists demonstrating long term outcomes and knowledge of the safety of this technique is reliant on small cohort studies.

## Aim of Study

To undertake a large cohort study, assessing the medium to long term outcomes of pre-pectoral implant-based reconstruction with acellular dermal matrix (ADM) coverage.

## Methods

We undertook analysis of a prospectively maintained database of pre-pectoral implant-based breast reconstruction at a large volume tertiary referral centre. Patient, clinical and operative factors were studied, along with complications and implant loss rates.

Patients underwent pre-pectoral reconstruction with anterior ADM coverage, using either porcine (Strattice™, Artia™) or bovine ADM (Surgimend®). Mastectomy incision type depended on whether the nipple was to be preserved and grade of ptosis as part of the patient-centred, joint decision making process

All procedures were performed with antibiotic coverage. Wounds were closed with subcuticular sutures and tissue glue. Drains were left in situ for 7-14 days post-operatively, until drainage volumes were <30mls/24 hours.

## Results

Between March 2013 and October 2019, 553 pre-pectoral reconstructions were performed in 355 patients. Patient demographics and indications for procedures are shown in Table 1 and Figure 2. Surgical data is shown in Table 2. Patients were followed for a mean of 40 months (range 1-80 months).

Demographics	
Mean Age (Range)	44.1 (20-82)
Mean BMI (Range)	25.7 (17-43)
Smokers (%)	20 (5.5%)
Diabetes Mellitus (%)	12 (3.4%)
Previous radiotherapy (%)	6 (1.8%)

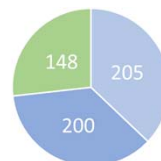


Table 1: Included Patient Demographics

Figure 2: Indications for Breast Reconstruction

Mean Mastectomy Weight (Range)	527g (69-3720g)
Mean Implant Size (Range)	423cc (120-685cc)
<b>Procedure Type</b>	
- Direct-to-implant	95%
- Two Stage with Tissue Expander	5%
<b>ADM Coverage</b>	
- Full ADM Cover	84.3%
- Upper Pole ADM + Inferior Dermal Flap	15.7%
<b>Incision</b>	
- Inframammary Fold	42%
- Peri-areolar	26%
- Elliptical	15%
- Skin Reduction Technique, e.g. Wise Pattern	17%
<b>Adjuvant Therapy</b>	
- Neoadjuvant chemotherapy	16%
- Adjuvant chemotherapy	18%
- Adjuvant radiotherapy	12%

Table 2: Surgical data for all patients in this cohort



Figure 3: Pre- and post-operative pictures following pre-pectoral implant reconstruction using an inframammary incision (A) and a peri-areolar incision (B)

- Complication rates within first 60 days:
  - Major (Skin necrosis, nipple necrosis): 7%
  - Minor (Seroma, red breast, stitch abscess): 4%
- Total implant loss rate: 2.7%
- Late Complications:
  - Capsular Contracture (Grade III/IV): 1.2%
  - Implant Rotation: 2.4%
  - Implant Rippling: 8.5%
- Implant rippling required treatment by lipofilling in 5.4% of cases. Pre- and post- lipofilling results are shown in Figure 4.



Figure 4: Appearances pre-lipofilling and post-lipofilling (at 12 months)

In the multi-nominal regression model, smoking and mastectomy weight were independently associated with the development of major complication. Implant loss was significantly predicted by concurrent axillary surgery and adjuvant radiotherapy, but neither were independently predictive.

## Discussion

Our results demonstrate the safety and low morbidity of pre-pectoral reconstruction with ADM, with good long term results. Previous studies have shown that pre-pectoral reconstruction has similar outcomes to sub-pectoral reconstruction,<sup>1,2</sup> with the added benefit of elimination of animation deformity.<sup>1</sup> There are also reports of reduced capsular contracture rates in pre-pectoral reconstruction.<sup>2</sup> In our study, mastectomy weight and smoking were associated with increased risk of major complications. High body mass index has also been reported as a risk factor for complications.<sup>3</sup> Our implant loss rates are low, compared with national data.<sup>4</sup> Pre-pectoral reconstruction can be associated with visible implant rippling in a small subgroup of patients. The appearance of this can be improved with autologous fat grafting,<sup>5</sup> as shown in our study.

## Conclusion

Pre-pectoral implant-based breast reconstruction is associated with low morbidity and good patient outcomes. However, patients with the usual risk factors have increased risk of complications, which should be borne in mind when selecting patients for this procedure.

## References

1. Nealon et al, PRS, 2020; 145(5):898e
2. Li et al, Ann Plast Surg, 2020; [epub]
3. Banuelos et al, PRS, 2019; 17 [epub]
4. Potter et al, Lancet Oncol, 2019; 20(2):245
5. Darrach et al, Gland Surg, 2019; 8(1):61