Background: The internal mammary vessels (IMVs) are the most commonly used recipients for microsurgical breast reconstructions. Often, the costal cartilage is sacrificed in order to obtain improved vessel exposure. In an effort to reduce adverse effects associated with traditional rib-sacrifice, recent studies have described less invasive, rib-sparing strategies.

Methods: After obtaining IRB approval, a retrospective review of all patients undergoing microsurgical breast reconstruction at a single institution between November 2007 and December 2013 was conducted. Patients were divided into two cohorts for comparison: rib-sacrificing and rib-sparing IMV harvests.

Results: A total of 547 reconstructions (344 patients) met inclusion criteria for this study. 64.9% (n=355) underwent rib-sacrificing IMV harvest. Cohorts were similar in baseline patient characteristics, indications for surgery, and cancer therapies. However, patients undergoing rib-sparing reconstructions had significantly shorter operative times (440 minutes vs. 476 minutes; $p<0.01$), and significantly less postoperative pain on POD1 (2.8/10 vs. 3.4/10; $p=0.033$) and POD2 (2.4/10 vs. 3.0/10; $p=0.037$). Furthermore, patients undergoing rib-sparing techniques had greater incidence of fat necrosis requiring excision (12.5% vs. 2.8%; $p<0.01$) and a trend towards higher incidence of hematoma, venous thrombosis, and arterial thrombosis when compared to rib sacrificing patients.

Conclusions: Rib-sparing harvest of internal mammary vessels is a feasible technique in microsurgical breast reconstruction. However, given the significant increase in fat necrosis requiring surgical excision, the trend towards increased postoperative complications, and no significant difference in postoperative revision rates, the purported benefits of this technique may fail to outweigh the possible risks.

**Conclusions:** Therapeutic level III