Mastectomy skin necrosis following mastectomy and immediate breast reconstruction: a systematic review

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Introduction

Skin-sparing (SSM) and nipple-sparing mastectomy (NSM) followed by immediate breast reconstruction are well-established practices that are both oncologically safe and psychologically beneficial to breast cancer survivors. Mastectomy skin necrosis (MSN) is an important complication following mastectomy and immediate breast reconstruction, as it can result in potentially devastating consequences such as prosthetic infection, reoperations, loss of reconstruction, and delays in initiation of adjuvant therapy.

Objective

The aim of this study is to assess the incidence and risk factors associated with MSN.

Methods

A literature search of the English literature listed in the MEDLINE (Ovid MEDLINE 1950 to December 2010) and EMBASE (1988 to 2010) databases identified 475 studies. Eligible studies were full-text articles addressing MSN as a primary or secondary outcome. Data extraction was performed by two reviewers working in duplicate and independently to extract study characteristics, quality and outcomes data.

Results

475 articles identified, 90 publications of variable quality met the inclusion criteria. Overall incidence of MSN reported in the reviewed articles was 9.8%, ranging from 0% to 30%. Patient-related risk factors most frequently associated with this complication are: obesity, diabetes, smoking, large breast size, and radiation therapy. Within the studies reviewed, other potential factors that may affect mastectomy skin flap survival are: type of reconstruction, incision location, and neoadjuvant chemotherapy. Most publications reviewed did not address important surgeon-related risk factors such as mastectomy skin flap thickness, implant size, or intraoperative tissue expander fill volume.

Discussion

MSN is a significant complication that can result in negative cosmetic outcomes and delayed adjuvant therapy. However, MSN is probably underreported, This systematic review highlighted the lack of standardized method of reporting MSN, which may contribute to the wide range of incidence reported. Most studies included in this review used a binary system (i.e., yes/no) to report the incidence of MSN. However, we believe that a grading system taking into account both surface area involved and thickness of skin necrosis would be more useful to rigorously assess outcomes. Furthermore, intraoperative use of imaging studies including spectroscopy, mapping with laser-assisted indocyanine green or fluorescein dye may be useful to provide real-time assessment of mastectomy skin blood supply, and to guide intraoperative management that may help avoid this complication altogether.

Conclusion

This review reveals underreporting of MSN following mastectomy and immediate breast reconstruction. Further studies are necessary to assess the impact of patient-related and surgeon-related risk factors on this complication. Substantial advances with respect to the development of standardized, validated reporting methods are required.