



Intraoperative Evaluation of the Nipple Margin in the Decision Making for Nipple-Sparing Mastectomies

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BACKGROUND

Nipple-sparing mastectomies (NSMs) are increasingly performed for the surgical treatment of invasive and in situ breast cancer.

Evaluation of the nipple margin by frozen section (FS) is used to decide at the time of surgery whether or not to preserve the nipple.

We examined the effectiveness of this approach.

METHODS

We studied a consecutive series of NSMs at our institution from 3-2007 to 5-2011.

FS and final permanent diagnoses (PS) were recorded in addition to the preservation of the nipple complex at the time of surgery.

Discrepancies between frozen and permanent section diagnoses were recorded and categorized as “major” or “minor”.

Major discrepancies were defined as FS diagnoses that were not confirmed on review of the PS and may have or did alter decisions at the time of surgery (ie: removal or preservation of the areolar complex).

Minor discrepancies were defined FS diagnoses that were not confirmed on review of the PS but did not or were highly unlikely to alter surgical decisions or surgical outcome.

RESULTS

Sixty-five total NSMs were performed on fifty-three patients from 3-2007 to 5-2011 at our institution.

Thirty NSMs were performed on breasts without evidence of malignancy (benign NSMs). Twenty-seven of these specimens were sent for FS evaluation (90%).

Thirty-five NSMs were performed on breasts that had biopsy proven malignant lesions prior to surgery (malignant NSMs). Thirty of these specimens were sent for FS evaluation (86%).

RESULTS

TABLE 1.

# of Specimens (n=27)	Frozen Section Diagnosis	Permanent Section Diagnosis	Nipple Preserved?
22	Benign breast tissue	Confirmed	Y
1	Benign breast tissue	LRDIN, negative for malignancy Minor discrepancy	Y
1	LRDIN, FCC	Confirmed	Y
1	Minimal epithelial proliferation with atypia in a major duct, no invasive carcinoma	Benign breast tissue Major discrepancy	Y
1	LRDIN, DE, negative for malignancy	LRDIN Minor discrepancy	Y
1	Negative for invasive carcinoma, cannot rule out low-grade DIN	Benign breast tissue Minor discrepancy	Y

Table 1. Results of intraoperative frozen section on all **benign** NSMs. LRDIN=low-risk ductal intraepithelial neoplasia (usual ductal hyperplasia), FCC=fibrocystic changes, DE=duct ectasia, DIN=ductal intraepithelial neoplasia (ductal carcinoma in-situ), Y=Yes.

TABLE 2.

# of Specimens (n=30)	Frozen Section Diagnosis	Permanent Section Diagnosis	Nipple Preserved?
22	Benign breast tissue	Confirmed	Y
2	LRDIN	Confirmed	Y
1	Papillary lesion, negative for malignancy	IDP with LRDIN Minor discrepancy	Y
1	Invasive lobular carcinoma (Figure 1A)	Confirmed	N
1	Focal intraductal proliferation suspicious for atypia (Figures 1B and 1C)	Focal intraductal proliferation, negative for malignancy Major discrepancy	N
1	IDP with LRDIN, negative for malignancy	Confirmed	Y
1	Focal DIN grade 2 close to new margin	Confirmed	Deferred for additional sample (see row below)
1	Invasive ductal carcinoma	Confirmed	N

Table 2. Results of intraoperative frozen section on all **malignant** NSMs. LRDIN=low-risk ductal intraepithelial neoplasia (usual ductal hyperplasia), IDP=intraductal papilloma, DIN=ductal intraepithelial neoplasia (ductal carcinoma in-situ). Y=Yes, N=No.

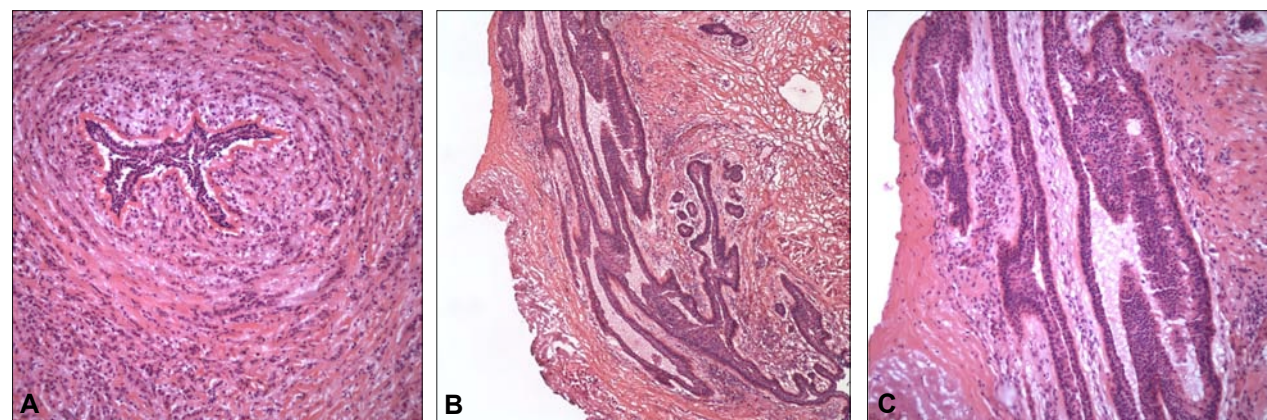


Figure 1. A. High-power view of FS slide on which a diagnosis of lobular carcinoma was made and the nipple was appropriately excised. **B and C.** Low and high-power views of FS diagnosed as ductal atypia, not confirmed on permanent section, resulting in inappropriate excision of the nipple.

RESULTS

Of the twenty-seven benign NSMs evaluated at FS, three minor discrepancies were identified (11%) and one major discrepancy was identified (4%), for a total discrepancy incidence of 15%. Two discrepancies, one of which was the major discrepancy, were false-positive findings (**Table 1**).

No discrepancies within the benign NSM group resulted in an inappropriate surgical intervention.

Of the thirty malignant NSMs evaluated at FS, one minor and one major discrepancy were identified for a total discrepancy incidence of 7%. Both discrepancies were false-positive findings (**Table 2**).

The single major discrepancy in the malignant breast resulted in inappropriate surgical excision of the nipple. This was the only instance in our series where the nipple was inappropriately excised as a direct result of frozen section diagnosis.

CONCLUSIONS

- Findings necessitating surgical excision of the nipple are infrequent at the nipple margin.
- Our data suggests that there is a significant risk of over-interpreting findings at the nipple margin as atypical and may lead to inappropriate excision of the nipple.
- In our series, no false negative frozen section diagnoses were recorded.

FUTURE DIRECTIONS

We are obtaining additional clinical data to determine the surgical outcome as defined by clinical parameters including disease recurrence and removal of the nipple in subsequent surgical procedures.