

BACKGROUND

- Breast conserving therapy for cancer requires the excision of all tissue involving the tumor with surrounding negative margins.
- For non-palpable cancers, intra-operative specimen radiography has been demonstrated to reduce the need for re-excisions.¹⁻³
- Specimen radiographs are now obtainable using new tomosynthesis technology allowing for 3D evaluation of breast specimens.
- The current pilot study is the first to correlate standard (2D) specimen radiographs versus tomosynthesis (3D) radiographs with final histopathology.

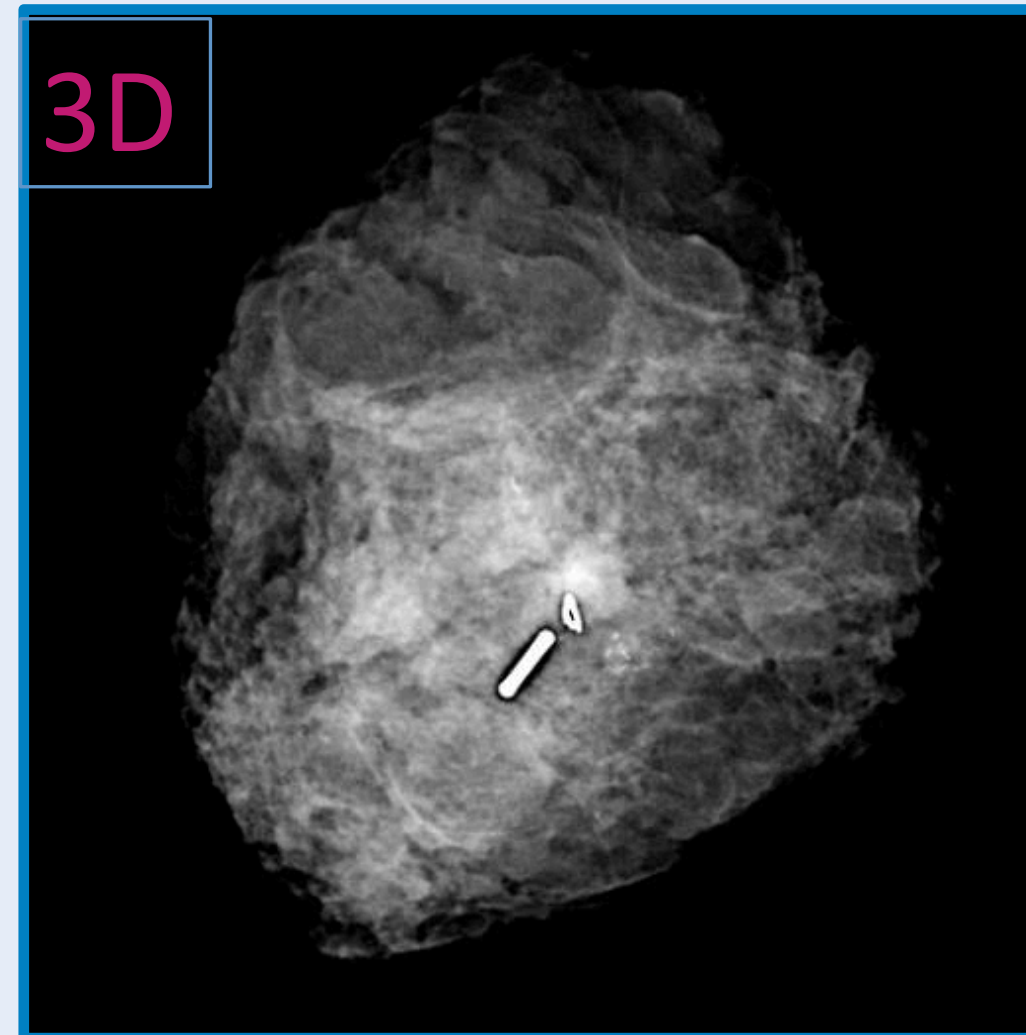
METHODS

- Retrospective review identified 50 specimen radiographs that contained calcifications and had undergone both 2D and 3D imaging as a standard part of a surgical procedure from October to December 2015. 7 met final inclusion criteria.
- Tomosynthesis radiographs allowed for 1mm cuts to be assessed thru the specimen to estimate distances (Mozart® System with TomoSpec® Technology, KUB Technologies, Inc, Millford, CT, USA). 2D images were evaluated with the available static radiographs.
- These assessments were performed for both 2D and 3D images and then correlated with final pathology.
- Imaging was analyzed by a surgeon not involved in the procedure to estimate the distance from tumor to the edge of the specimen at the superior, lateral, inferior, and medial aspects.

2D



3D



RESULTS

FIGURE 1. SPIDER GRAPHS OF EACH SPECIMEN RADIOGRAPH AND FINAL HISTO-PATHOLOGICAL MARGIN CORRELATION

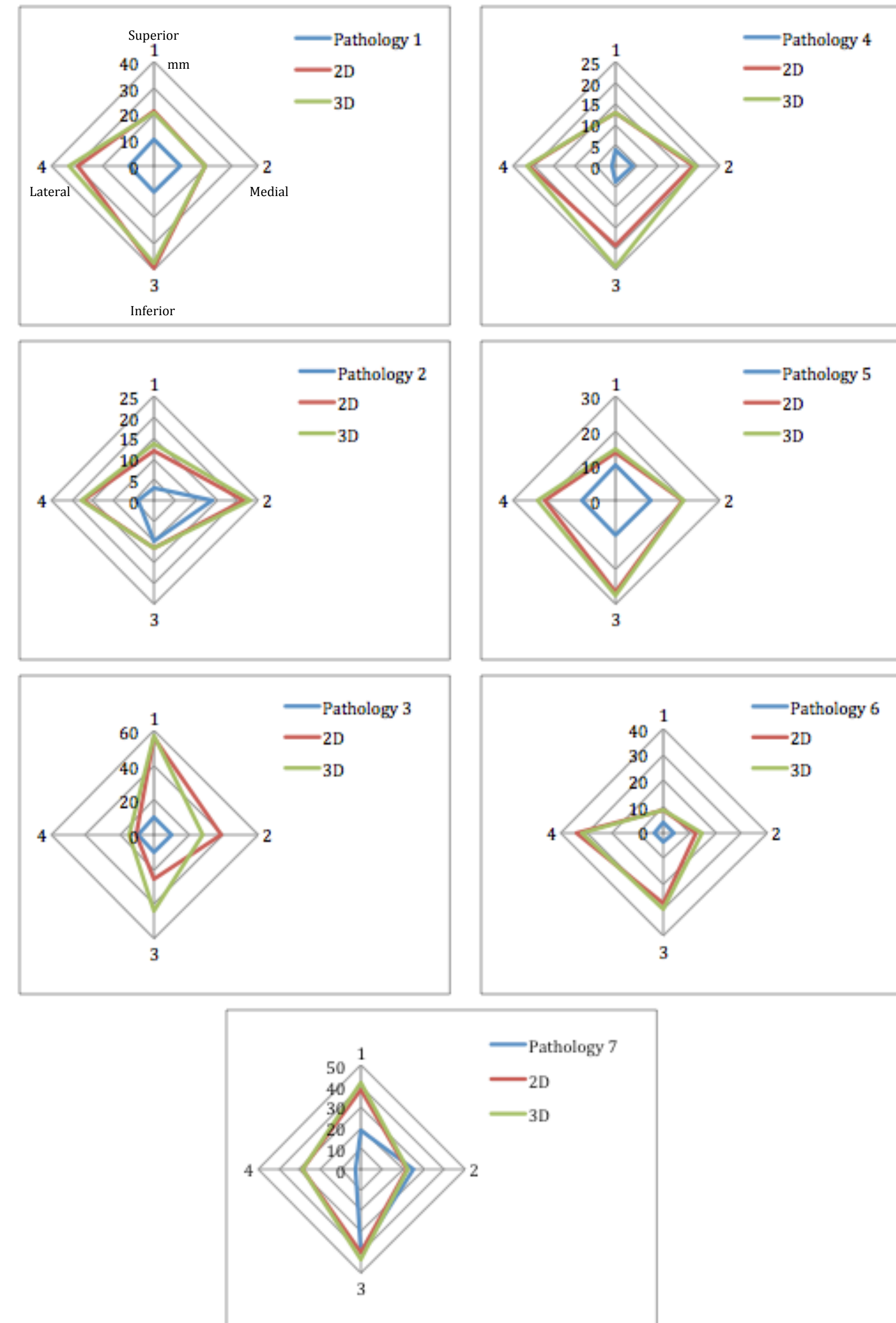
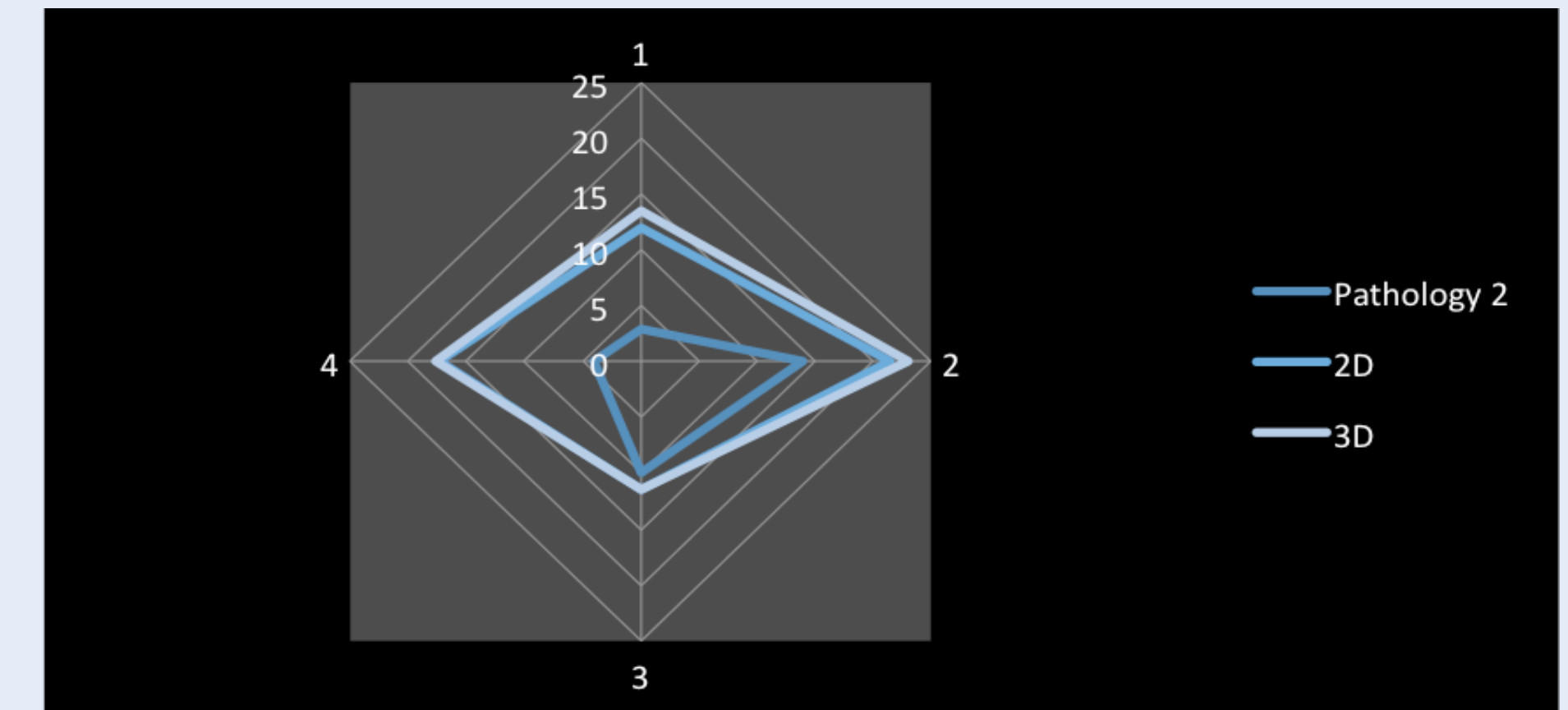


TABLE 1. DEMOGRAPHIC DATA AND HISTOLOGIC SUBTYPES

PARAMETER	VALUE
NUMBER OF EXCISIONS	7
MEAN AGE AND RANGE	58 (47 – 80)
MEAN BMI AND RANGE	32 (25 – 40)
TUMOR SIZE	
< 1.0 cm	3
1.01 – 2.0 cm	3
> 2.0 cm	1
MEAN TUMOR GRADE	2
MULTIFOCAL / LYMPHOVASCULAR INVASION	1
ABSENT	6 / 6
PRESENT	1 / 1
DIAGNOSIS	
DCIS	2
LCIS	2
INVASIVE + DCIS	3

FIGURE 2. SPIDER GRAPH INCLUDING ALL SPECIMEN RADIOGRAPHS AND FINAL HISTO-PATHOLOGICAL CORRELATION



CONCLUSIONS

- Intra-operative specimen radiograph utilizing tomosynthesis allows for accurate assessment of margin status and facilitates reduced rates of re-excision for patients undergoing breast conserving therapy for cancer.
- Tomosynthesis imaging allowed for better clarity of specimen edges (compared to 2D) and correlated well with final negative or positive margin status based on histopathology
- Tomosynthesis may also allow for more rapid evaluation of specimen radiographs.

REFERENCES

- McCormick JT, Keleher AJ, Tikhomirov VB, et al. Analysis of the use of specimen mammography in breast conserving therapy. *Am J Surg.* 2004;188:433-6
- Bathia L, Harris A, Davey M, Sharma P, Silva E. High resolution intra-operative two-dimensional specimen mammography and its impact on second operation for re-excision of positive margins at final pathology after breast conserving therapy. *Am J Surg.* 2010;202:387-394
- Kim SHH, Comacchi SD, Heller B, Farrokhyar F, Babra M, Lovrics. An evaluation of intraoperative digital specimen mammography versus conventional specimen radiography for the excision of nonpalpable breast lesions. *Am J Surg.* 2013;205:703-710