

COMPARING SONOGRAPHIC MEASUREMENTS OF MALIGNANT UNIFOCAI TUMOURS WITH PENUMBRA FEATURES AGAINST HISTOLOGY

BY SAMANTHA WEST



East Lancashire Hospitals
NHS Trust
A University Teaching Trust

INTRODUCTION AND BACKGROUND

Pictorial review to determine if measurement of the echogenic penumbra is more accurate when compared to measuring the nidus of the tumour against the gold standard histology.
The accurate measurement and assessment of breast cancers pre-operatively is essential, as it is used to determine the surgical management of patients with breast cancer.

AIMS AND OBJECTIVES

Review and compare the accuracy of the sonographic breast tumour with the nidus and echogenic penumbra and compare against the gold standard histological tumour size.

Compare results with current literature.
Determine if any significant differences in accuracy,
Impact on surgical pathway & Potential to change practice.

Currently measure :
Hypoechoic BLACK area =Nidus = pale green line for nidus Measurement
PURPLE area indicates = Hyperechoic Penumbra = emerald green line for penumbra measurement

Method

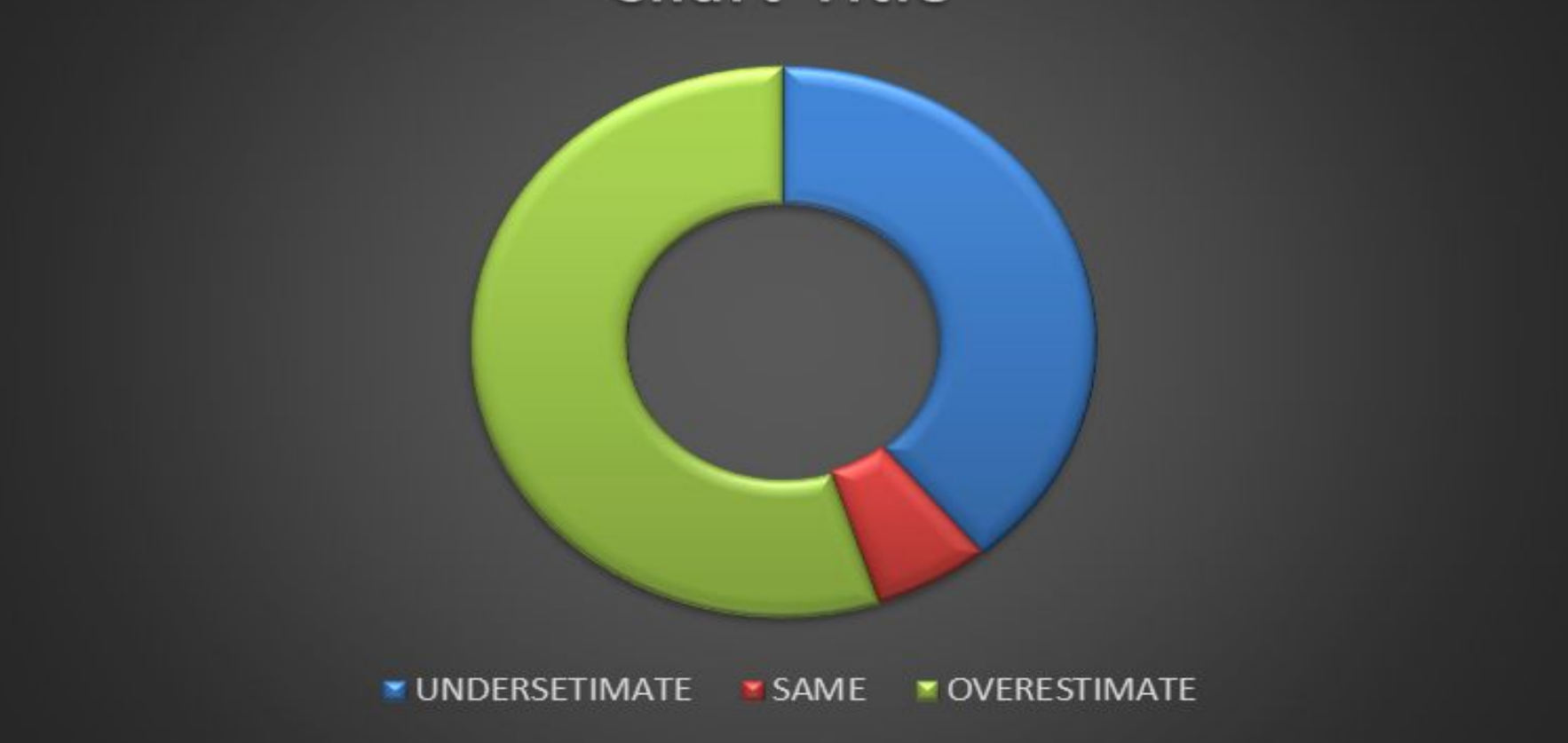
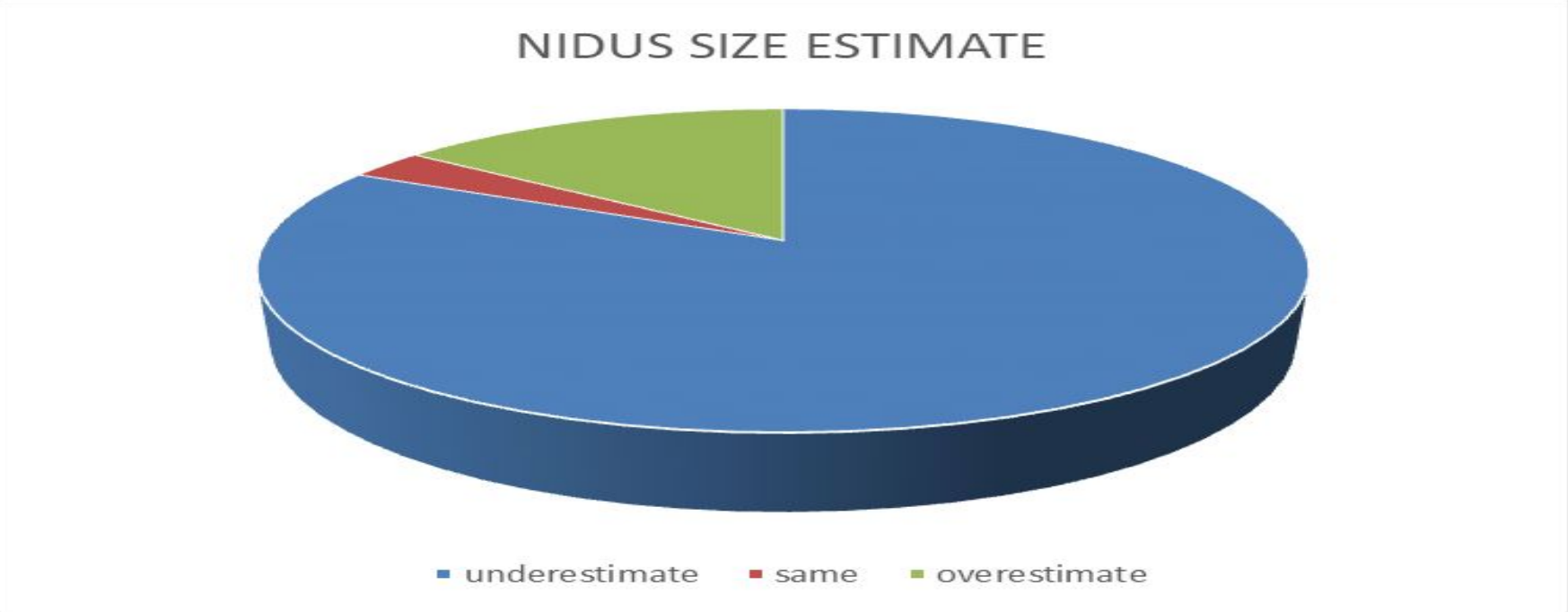
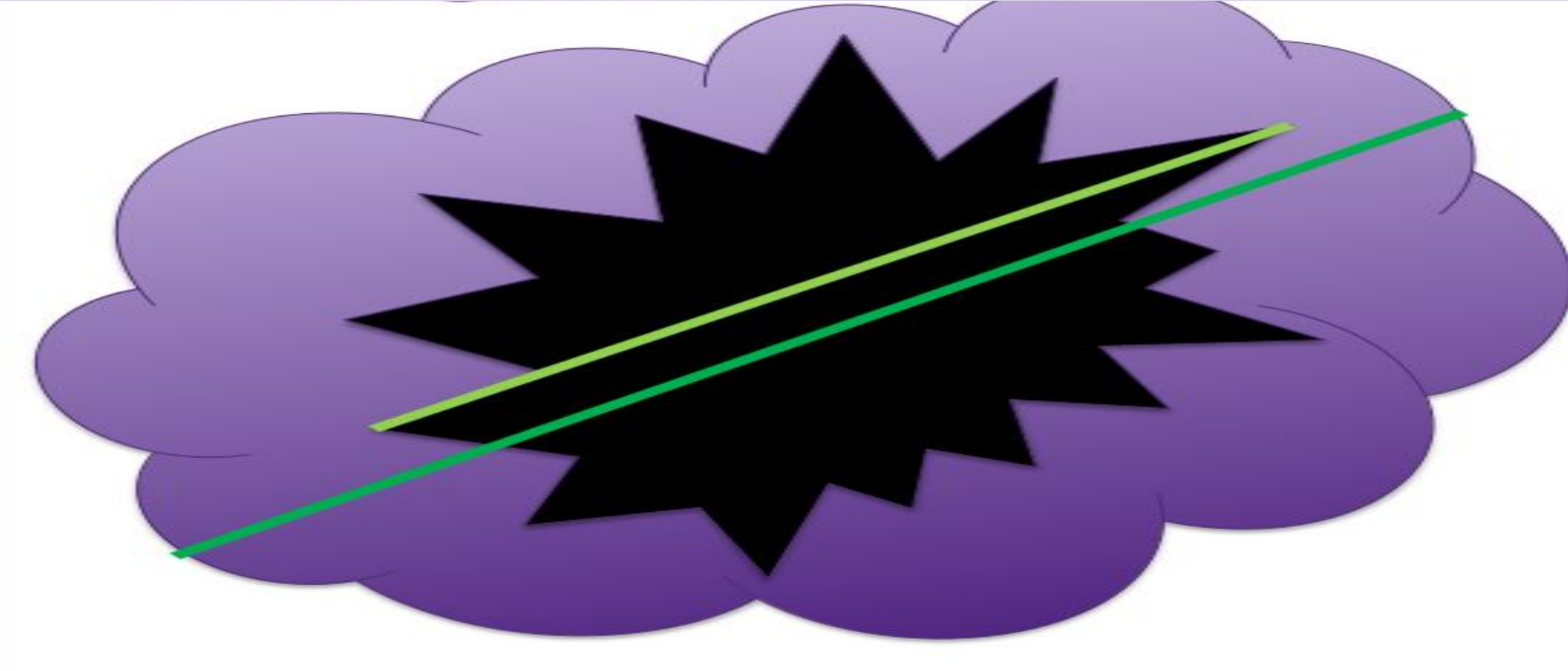
Retrospective study - 7 months data collection
3 readers
Data set - NBSS crystal report
Compare the ultrasound measurement against histology
Tumour to be unifocal with obvious echogenic penumbra
Exclusions:
Multi-focal, DCIS, B3 lesions and asymmetries

Results

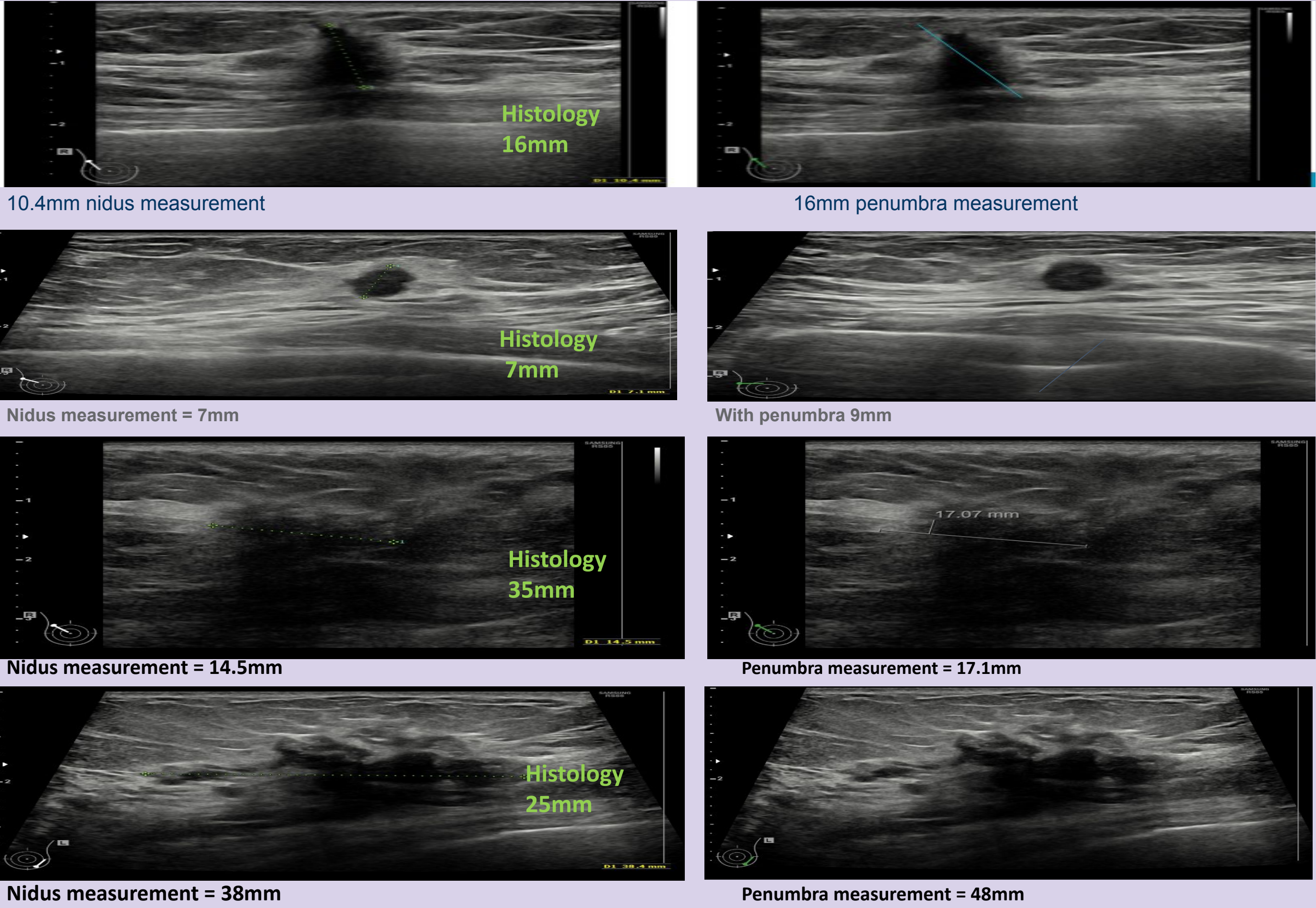
Nidus size
82% underestimate
3% same size
15% overestimated
When compared to Histological size.

Penumbra Size
39% Under estimated
6% same size
55% Over estimated
When compared to Histological size.

*104 in the study : 33 excluded in the study due to being either unfit for surgery or having neoadjuvant treatment



Discussion



Underestimation & Overestimation:

- Stiffness of tumour
- Unclear margins of sonographic results from extensive intraductal components
- Posterior Acoustic shadowing hides the posterior edge of the tumour, especially in smaller tumours
- Size of tumour – if large then whole of tumour may not be wholly imaged on the screen therefore making it difficult to measure full area of tumour
- Different interpretation of tumour size; the difference in edge perception ,which also leads onto the edge perception of the penumbra around the tumour
- Measuring the actual penumbra can be difficult; where does it start and finish

Summary

- Measurement can be subjective as each operator may perceive the measurement differently
- Measuring the actual penumbra can be difficult; where does it start and finish
- Sometimes the acoustic shadowing from dense tumours can make the measurement of tumour size difficult and therefore less accurate
- Overall, our accuracy mean measurement is within 5mm of the histological size, which is same parameters as current literature

Conclusion

When the penumbra is included in overall measurement, neither the nidus measurement or the penumbra measurement appears to be nearer the histological measurement.

The penumbra measurement is not an accurate measurement parameter when it is compares to the histological tumour dimension.

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