**Telecytology and ROSE – linking Newcastle and Tweed Heads**

Juan Olivares1, Alison Guider1, Simon King1 and Mark Formby1
Anatomical Pathology, NSW Health Pathology, John Hunter Hospital, Newcastle, NSW, Australia

### Introduction

Fine needle aspiration cytology (FNAC) with rapid on-site evaluation (ROSE) improves the diagnostic yield of the procedure by ensuring specimen adequacy1 as well as allowing adequate triage of limited specimens2. Telecytology is the examination of cytological material using digital images3. It has potential to offer cutting edge diagnostic services to people living in remote/rural Australia improving speed of diagnosis, ancillary testing and ultimately access to treatment.

The objective is to evaluate the impact of ROSE Telecytology on adequate specimen sampling and diagnostic rates.

### Method

Cytotechnologists (CT) from NSW Health Pathology – North, located at John Hunter Hospital (JHH) in Newcastle, Australia have recently been providing ROSE Telecytology to The Tweed Hospital (TTH) located approximately 670km north of Newcastle. Patients with a concerning lesion are booked for a diagnostic biopsy at TTH for which TTH pathology staff attend and notify JHH staff in Newcastle via telephone. A live Skype® video feed hosted by TTH is established which JHH join virtually. TTH pathology staff prepare slides from diagnostic material collected by the clinician and operate a microscope with an attached camera for live video feed via computer, allowing CT at JHH to view on their computer and perform ROSE. Upon procedure conclusion collected material is then submitted to JHH laboratory for further preparation and screening where cytopathologists (CP) render the final diagnosis. At time of writing, 43 specimens have been obtained utilising ROSE Telecytology. Data was collated with concordance between ROSE, CT (post screening) and CP being assessed for both. This data was compared with the concordance rate of 100 recent CT attended FNA procedures at JHH.

### Results

Preliminary data showed the concordance rates between ROSE and CP for ROSE Telecytology cases were 67% for malignant (16/24), 54% for benign (7/13) and 50% for non-diagnostic (1/2). The overall concordance rate was 58% (25/43). The overall concordance rate between CT and CP upon subsequent review was 91% (39/43).

Comparatively, JHH ROSE concordance rates of the 100 cases sampled were 96% for malignant (71/73), 85% for benign (16/20) and 100% for non-diagnostic (3/3). The overall concordance rate was 92% (92/100). The overall concordance rate between CT and CP for JHH ROSE cases upon subsequent review was 96% (96/100).

### Discussion

ROSE Telecytology has only recently begun between The Tweed Hospital and John Hunter Hospital. The overall concordance rate between preliminary diagnosis on ROSE Telecytology and final diagnosis was lower than expected (54%), particularly as concordance rates for JHH ROSE cases (n=100) were 92%. Contributing factors include limited experience of Tweed Hospital staff on slide preparation and microscope operation, and CT degree of familiarity with televised images and confidence to diagnose on these images; for example one specimen considered diagnostic at ROSE was non-diagnostic on final report (1/2), which is likely a result of one of the aforementioned contributing factors. It should be noted that staff operating the microscope from Tweed Heads lack the comprehensive training which CT and CP undergo to adequately assess and recognise appropriate cellular material for visualisation via Telecytology.

The overall inadequacy rate was relatively low at ~5% (2/43) which supports the validity of this process. It is anticipated the concordance rate will improve as experience is gained by the operators and the assessors at each site. This is further supported by the high concordance rate observed for on-site ROSE between CT and CP (92%), as well as the high concordance rates seen from CT and CP upon subsequent review (91% for ROSE Telecytology and 96% for JHH ROSE). Concordance rates will continue to be monitored as more ROSE Telecytology cases are performed between Tweed Heads and JHH. Ongoing support and training of staff involved at Tweed Heads and JHH will continue during this time.

Preliminary data is encouraging and JHH hope to expand this service (ROSE Telecytology) to other regional facilities.

### Conclusions

ROSE Telecytology has established itself as a viable option for clinicians who desire adequacy assessment but do not have on-site access to cytopathological support.

### References


### Acknowledgements

Special thanks to Rosaria Errichiello and Tweed Heads colleagues for their dedication to facilitating this innovative service. Special thanks also to NSW Health Pathology in allowing facilitation of this exciting frontier in advancing service.