



Grundium versus Glass: A look at the use of the Grundium Ocus as a Telepathology Tool for Surgical Pathology and Cytopathology



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ABSTRACT

Background: The Grundium Ocus is a compact portable digital microscope and slide scanner ideal for desktop use. It permits whole slide imaging (WSI) as well as robotic microscopy. We compared the performance of this device to a conventional light microscope with glass slides for second opinion teleconsultation and telecytology.

Methods: Ocus was compared to glass slide reads with a two-week washout period for three use cases: (1) second opinion teleconsultation of gastrointestinal pathology cases (WSI), (2) second opinion teleconsultation of cytology cases (WSI), and (3) rapid on-site evaluation (ROSE) via telecytology (robotic). For each use case two pathologists evaluated 20 slides (1 representative slide/case). Cytology cases included various preparations (smears and liquid-based specimens). Diagnoses and time spent evaluating each case were recorded.

Results: The Grundium device was feasible for WSI and robotic microscopy using a variety of specimen preparations. There was no significant difference between Grundium and glass slides for permanent histology sections. For cytology cases viewed by WSI, glass slides had significantly higher specimen adequacy rates (80% Ocus, 95% glass), malignancy rate (62.5% Ocus, 40% glass), and accuracy with final diagnosis (77.5% Ocus, 100% glass) and were quicker to evaluate. For ROSE by robotic microscopy, glass slides had higher adequacy rates and were significantly quicker to review (average 3.4 minutes Ocus, 1.25 minutes glass).

Conclusions: The Grundium Ocus device allowed hybrid WSI and robotic microscopy which thereby supported different telepathology use cases. The device is suitable for reviewing different histopathology slides. Whilst glass slides were preferred for diagnostic interpretation and speed of use during ROSE, robotic microscopy permitted cytology cases to be remotely interpreted via telecytology.

BACKGROUND

- The *Grundium Ocus* is a compact portable digital microscope and slide scanner (Figure 1) that is ideal for desktop use.
- It permits whole slide imaging (WSI) as well as robotic microscopy.
- We compared the performance of this device to a conventional light microscope with glass slides for second opinion teleconsultation and telecytology.

METHODS



Figure 1. Grundium Ocus® microscope scanner. This desktop hybrid device with 1 slide capacity has a small (3.5 kg, 18 x 18 x 19 cm) footprint.

- Ocus was compared to glass slide reads with a 2-week washout period for 3 use cases:
 - 2nd opinion teleconsultation of gastrointestinal pathology cases (WSI)
 - 2nd opinion teleconsultation of cytology cases (WSI)
 - Rapid on-site evaluation (ROSE) via telecytology (robotic)
- For each use case 2 pathologists evaluated 20 slides (1 representative slide/case).
- Cytology cases included various preparations (smears and liquid-based specimens).
- Diagnoses and time spent evaluating each case were recorded.

RESULTS

- The Grundium device was feasible for WSI and robotic microscopy using a variety of specimen preparations.
- There was no significant difference between Grundium and glass slides for permanent histology sections.
- For cytology cases viewed by WSI, glass slides had significantly higher specimen adequacy rates (80% Ocus, 95% glass), malignancy rate (62.5% Ocus, 40% glass), and accuracy with final diagnosis (77.5% Ocus, 100% glass) and were quicker to evaluate.
- For ROSE by robotic microscopy, glass slides had higher adequacy rates and were significantly quicker to review (average 3.4 minutes Ocus, 1.25 minutes glass).

CONCLUSIONS

- The Grundium Ocus device allowed hybrid WSI and robotic microscopy which thereby supported different telepathology use cases.
- The device is suitable for reviewing different histopathology slides.
- Whilst glass slides were preferred for diagnostic interpretation and speed of use during ROSE, robotic microscopy permitted cytology cases to be remotely interpreted via telecytology.

