AI vs. Microscope in Primary Diagnosis: Novel AI-Based Solution Increases the Efficiency and Accuracy of Prostate Biopsies Reporting

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The global increase in cancer cases, advances in personalized medicine and growing complexity of pathologists’ diagnoses result in high demand to implement computer-assisted solutions that help pathologists improve accuracy and efficiency in cancer diagnosis. Ibex Medical Analytics developed Galen™ Prostate, an AI-based diagnostic solution for prostate biopsies that was recently validated in a study at the University of Pittsburgh Medical Center and demonstrated outstanding accuracy levels.

Cancer heatmaps: red areas indicate high probability of cancer, blue areas indicate low probability. Cancer heatmaps show high probability areas in red, low probability in blue.

**BACKGROUND & OBJECTIVE**

The increase in cancer cases, advances in personalized medicine and growing complexity of pathologists’ diagnoses result in high demand to implement computer-assisted solutions that help pathologists improve accuracy and efficiency in cancer diagnosis.

**STUDY OBJECTIVE**

The Galen Prostate system significantly improves diagnostic efficiency, with 21% reduction in diagnosis time and 37% increase in productivity compared to the microscope.

**RESULTS**

Galen Prostate significantly improved diagnostic efficiency, with 21% reduction in diagnosis time and 37% increase in productivity compared to the microscope.

**EXAMPLES OF MISDIAGNOSIS ON THE MICROSCOPE AND DETECTED CORRECTLY USING GALEN PROSTATE**

- Benign slide misdiagnosed as cancer on the microscope.
- Cancer slide misdiagnosed as benign on the microscope.

**CONCLUSIONS**

This is the first large-scale study, in which pathologists perform full primary diagnosis on the support of an integrated AI-based solution for prostate biopsies.

1. **AI vs. Microscope in Primary Diagnosis: Novel AI-Based Solution Increases the Efficiency and Accuracy of Prostate Biopsies Reporting**

2. **The Galen Prostate system significantly improved diagnostic efficiency, with 21% reduction in diagnosis time and 37% increase in productivity compared to the microscope.**

3. **Examples of misdiagnoses on the microscope and detected correctly using Galen Prostate.**

4. **Conclusions:**

   - This is the first large-scale study, in which pathologists perform full primary diagnosis on the support of an integrated AI-based solution for prostate biopsies.
   - Galen Prostate’s strong AI supports pathologists in the accurate detection and reporting of prostate biopsies (e.g., cancer, benign, tumor size, perineural invasion).
   - Reporting with Galen Prostate demonstrated high accuracy levels. Concordance between the AI-based classifications and the ground-truth results were extremely high.
   - AI-based classification, heatmaps and automated measurements significantly improved diagnostic efficiency.
   - This study shows that case turnaround time (TAT) can be significantly reduced in routine practice by using an AI solution integrated into the pathology workflow.

5. **Figure 1:**

   - **Top Left:** Cancer slide misdiagnosed as benign on the microscope.
   - **Top Right:** Benign slide misdiagnosed as cancer on the microscope.
   - **Middle Left:** Cancer slide misdiagnosed as benign on the microscope.
   - **Middle Right:** Benign slide misdiagnosed as cancer on the microscope.
   - **Bottom Left:** Cancer slide misdiagnosed as benign on the microscope.
   - **Bottom Right:** Benign slide misdiagnosed as cancer on the microscope.