Insights into Imaging
Volume 16
Supplement 1

ECR 2025

Book of Abstracts

Contents

ESR EUROPEAN SOCIETY OF RADIOLOGY × Springer

Evaluation of the diagnostic potential of a Tomosynthesis system for MSK

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Purpose or Learning Objective: Digital tomosynthesis (DTS) is a well-established technology that has become the gold standard for breast mammography. In recent years its benefits in musculoskeletal (MSK) imaging have been acknowledged, leading to a rapid increase in its utilization. It improves detection, localization and characterization of subtle fractures. In some patients DTS can alleviate the need for CT with lower complexity. Recently a new technology based on Cold Cathode Xray tube with a multi tube set-up has made this technology more affordable and accessible. The purpose of this study is to evaluate the diagnostic potential of the cold-cathode multi-tube DTS

Methods or Background: The study included 19 patients with suspected fractures who underwent CT and radiographs (XR). Patients were scanned using the cold-cathode DTS . 15 patients had imaging performed with Cast or metal. Images were evaluated by an MSK radiologist and orthopedic surgeon in consensus with CT as the gold standard. Studies were evaluated for presence, location, intraarticular involvement, displaced fragments and incidental lesions. The surgeon was asked whether DTS provided valuable information and whether it increased the confidence of the final diagnosis.

Results or Findings: In 17/19 studies DTS added value to the XR. In 7, DTS found fractures occult in XR. In 3, DTS was able to clear a suspected fracture. in 5, DTS was able to better localize the fracture. In 1, DTS was able to determine fracture age and in 1 study DTS found a sclerotic lesion obscured in XR. In addition, on XR the cast limited evaluation of fine bony details, however there was no such limitation with DTS

Conclusion: Cold cathode DTS provides high quality tomography of anatomies enabling depiction of occult pathologies, localization, characterization and resolution of questionable findings

Limitations: Initial study results

Funding for this study: Study was funded by Nanox-x Imaging Ltd.

Ethics committee - additional information: Study was approved by the local Ethics committee in the institution and each patient underwent informed consent

Author Disclosures:
Robenpour Ophir: Nothing to disclose
Laurian Copel: Nothing to disclose
Yiftah Beer: Nothing to disclose
Yotam Kimmel: Nothing to disclose
Yael S Schiffenbauer: Nothing to disclose
Nogah Shabshin: Consultant: Nano-x imaging
Sigal Tal: Nothing to disclose