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# Efficacy of US in Diagnosing Appendicitis: A Retrospective Study

**Naman Vashistha***

*NHS Foundation Trust, Manchester University, UK.*

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## ABSTRACT

Acute appendicitis is a common emergency, with approximately 50,000 appendectomies performed annually in the UK, making it a significant healthcare concern. Imaging is regularly used to confirm the diagnosis when in doubt. A wide variety of imaging modalities are being used by clinicians without support from any set guidelines or protocols. This study evaluates and compares the performance of various imaging modalities in detecting appendicitis. A retrospective study was conducted at Manchester Royal Infirmary, UK, analyzing 130 patients who underwent radiological imaging prior to appendectomy. The age and gender distribution of the sample was fairly balanced, with a mean age of 24.5 years and representation across all age groups. Due to the high efficacy of scans like CT and MRI, the overall competency of the radiology department in detecting appendicitis has been in line with expected standards-i.e. Sensitivity 97%, PPV & gt; 96%, and a negative appendectomy rate <3%. However, it was noted that US performance was not as reassuring. With a sensitivity of 53.6%, the US missed 21 cases of appendicitis out of 47 patients. Of these, 11 were later confirmed on CT, 6 on MRI, and 3 underwent appendectomy due to ongoing clinical concerns, with positive findings on histopathology. While CT is highly sensitive and has been shown to reduce negative appendectomy rates, there is a risk of radiation exposure. Ultrasound, on the other hand, is quick, widely available, and radiation-free but has inconsistent sensitivity and specificity. Ultrasound demonstrated poor performance in our study, making it a less reliable standalone diagnostic tool. Pregnant women and children mainly rely on the US due to its safety profile, but the sensitivity is much lower than other modalities, which can lead to missed diagnoses in these populations.

**Keywords:** Diagnosing appendicitis, Imaging comparison, Ultrasound efficacy, Missed appendicitis

**Abbreviations:** US: Ultrasound Scan; PPV: Positive Predictive Value; CT: Computed Tomography Scan; MRI: Magnetic Resonance Imaging; UK: United Kingdom

**Corresponding author:** Naman Vashistha, NHS Foundation Trust, Manchester University, UK, E-mail: Naman.vashistha@mft.nhs.uk

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