Can imaging have a beneficial effect on reducing negative appendicectomy rates – audit of current practice and imaging solutions

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BACKGROUND

~25% of attendances to Surgical Admissions Unit (SAU) and Surgical Ambulatory Care (SAC) are for RIF pain

National commissioning guidelines suggest the following for patients with a high clinical and biochemical suspicion of appendicitis:

- = laparoscopic appendicectomy
- = USS to exclude gynaecological pathology then laparoscopic appendicectomy if USS negative

Negative appendicectomy rate (NAR) is defined as the proportion of pathologically normal appendices removed in patients suspected of having appendicitis.

 Rates vary widely from institution to institution with rates reported up 50% in ♂

A negative appendicectomy has associated risks of complication & health economic consequences, due to cost of surgery & inpatient post-operative care, along with potential lost working hours in the convalescent period.

Imaging has been shown to improve the pre-operative diagnostic certainty of acute appendicitis over and above clinical and biochemical assessment.

Because of concerns about radiation exposure from CT, USS has been suggested as a safer primary diagnostic modality for appendicitis, with CT scanning used secondarily when ultrasound scans are inconclusive.

AUDIT PARAMETERS

Standard: NAR should be equal to or lower than accepted values.

Indicator: What is the local NAR?

Target: Accepted NAR should be 10-20%, but studies have shown rates <5% when imaging is employed.

METHODS

Retrospective review of all adult patients undergoing appendicectomy to determine NAR.

- Round 1 = 2 month study period
- Round 2 = 4 month study period

RESULTS – 1st Round Audit

136 consecutive patients having appendicectomy

- NAR = 36%
- ♂ = 23%
- ♂ = 47%

ACTION PLAN – 1st Round Audit

Imaging pathway introduced to scan all adult patients with suspected acute appendicitis and a raised WCC or CRP – see imaging pathway figure.

RESULTS – 2nd Round Audit

166 patients entered the imaging pathway

- NAR = 4%
- False negative rate* = 0%

120 patients had an appendicectomy without imaging

- NAR = 19%

Total NAR for all patients with and without imaging

- NAR = 10%

*scan reported as normal but found to have appendicitis

CONCLUSION

Imaging significantly reduces the NAR in both ♂ & ♂ patients = 36% to 4%

Other imaging pathway benefits:

- 95% are scanned within 12 hours or on an ambulatory basis 7 days a week
- 97% of CT reported within 1 hour
- Low dose CT average DLP of 244 mGy cm compared to the national DRL for a CT abdomen and pelvis of 745 mGy cm = 69.9% dose reduction
- Number of laparoscopies for this patient group has decreased by 25%
- Hospital stay has reduced by 24 hours

Negative outcomes:

- 60% of patients progress from US to CT - this is reducing (now ~40%)
- Extra USS & CT capacity required
- During the audit 40% of patients still had surgery without imaging, these patients still had a high NAR of 19%. Practice is changing with >85% now imaged.

Value Creation:

Cost

- Per patient cost of the pathway is ~£800 v £1340 if not on the pathway
- 1500 patients per year locally meeting the pathway criteria, thus saving nearly £1 million

Bed Days

- 24 hour reduction in hospital stay saves 1500 bed days per year

Non-operative management:

- Non-operative management has significant patient benefits – morbidity reduction, health-economic etc.