Investigation and management of suspected appendicitis during the COVID-19 pandemic

Editor

The COVID-19 pandemic resulted in widespread change to the organization and delivery of emergency general surgery services in the United Kingdom. The Royal College of Surgeons of England advised centres to avoid laparoscopy and to consider the need for emergency surgery given the increased risks during the pandemic. These guidelines were implemented in our institution on 26 March 2020.

We prospectively collected data on the investigation and management of patients with suspected appendicitis between 26 March and 6 May 2020. We retrospectively collected data on patients undergoing appendicectomy (28 February - 25 March 2020) to compare our operative approach and histology. We included patients aged >16 years of age admitted under the general surgery team. Patients receiving haemodialysis, chemotherapy or radiotherapy were excluded. Our primary outcome was to determine if SARS CoV-2 diagnosis altered the management of appendicitis, secondary outcomes included; negative appendicectomy rate (NAR), length of stay (LOS) and readmission rate.

Sixty seven patients were included in our analysis (26 March - 6 May 2020). Twenty nine were diagnosed with appendicitis (Table 1), 25 (86 per cent) had diagnosis confirmed on imaging (ultrasound or CT), 21 (72 per cent) undergoing CT. Nine had an appendicectomy – all performed open. NAR was 0 per cent. The remaining 20 were managed conservatively with antibiotics. Of these, one required percutaneous drain insertion under image guidance by an interventional radiologist.

Only one patient in our cohort was suspected of having SARS CoV-2 infection (based on chest radiographic appearances), with a subsequent negative PCR assay. They were treated conservatively for ultrasound proven appendicitis. There was a difference in LOS between patients undergoing conservative versus operative management for appendicitis (1 versus 3 days; \( P = 0.066 \) non-significant).

Twenty two patients underwent appendicectomy between 28 February and 25 March (Table 1). Eighteen (82 per cent) had positive imaging, 19 had a laparoscopic appendicectomy, three were done open. There was a higher rate of CT following the implementation of the new guidelines (72 versus 50 per cent; \( P = 0.145 \) non-significant). Two patients had a negative appendicectomy. NAR was higher (9 versus 0 per cent; \( P = 0.181 \), non-significant). LOS was comparable in the two operative groups (3 versus 3 days; \( P = 0.388 \)).

The COVID-19 pandemic has placed an unprecedented demand on health services demonstrating a need for data on its effect on surgical care and outcomes. With reports of increased morbidity and mortality for patients undergoing surgery following SARS CoV-2 exposure, national reform in the delivery of both elective and emergency surgery is unsurprising.

We report a noticeable change in practice during the COVID-19 pandemic, however the short timeframe for data collection with the need for early reporting has resulted in small case numbers. We managed the majority of appendicitis conservatively and when operating did not use laparoscopy. NAR has been reported as 20.6 per cent in large, international multicentre studies and as high as 50 per cent in individual centres. Increased CT use during this period may help explain the low NAR (0 per cent) in our data, though it is difficult to determine the significance given our small sample size. Patients managed conservatively had a shorter LOS without development of more complications or readmission.

Table 1 Key demographic and outcome data for cohorts before and after implementation of new RCSEng guidance

|                          | March cohort (n = 29) | April cohort (n = 22) | \( P \) |
|--------------------------|----------------------|-----------------------|-------|
| Age (years)              | 37 (19-80)*          | 37 (17-73)*           | 0.916 |
| Gender                   |                      |                       |       |
| Male                     | 12 (55%)             | 14 (48%)              | 0.779 |
| Female                   | 10 (45%)             | 15 (62%)              | 0.779 |
| Management               |                      |                       |       |
| Open surgery             | 3                    | 9                     | 0.193 |
| Laparoscopic             | 19                   | 0                     | <0.00001 |
| Conservative             | 0                    | 20                    | <0.00001 |
| Imaging                  |                      |                       |       |
| CT                       | 11 (50%)             | 21 (72%)              | 0.145 |
| USS                      | 6 (27%)              | 4 (4%)                | 0.295 |
| Complications            | 5                    | 2                     | 0.216 |
| Readmission              | 2                    | 2                     | 1.00  |
| Length of stay           |                      |                       |       |
| Operative Mx             | 3 days (1-7)*        | 3 days (2-4)*         | 0.388 |
| Conservative Mx          | N/A                  | 1 day (0-7)*          | N/A   |
| NAR                      | 2 (9%)               | 0 (0%)                | 0.181 |

*Values demonstrate medians and range. †Values showing statistical significance. CT = Computed Tomography; Mx = Management; NAR = Negative Appendicectomy Rate; USS = Ultrasound Scan.

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