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EDITORIAL

What is the appropriate management of acute uncomplicated appendicitis in contemporary South Africa?

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Acute appendicitis has afflicted humankind throughout our existence but has been a surgical disease for little over one hundred and fifty years. Leonardo da Vinci first drew the appendix in 1508, and several anatomists described it over the next two centuries. These included Berengarius in 1522, Andreas Vesalius in 1543 and Giovanni Battista Morgagni in 1719.[1] Several pathologists began to define and elucidate the pathophysiology of acute appendicitis and a number of authors from the enlightenment onwards began to describe what was termed typhlitis until Fitz, described a large series of acute appendicitis in 1886. The first recorded operation for acute appendicitis was by the expatriate French surgeon Amyand in London in 1753. An eleven-year-old boy underwent surgery for a draining groin hernia which was found to contain an inflamed perforated appendix.[1] A number of surgical pioneers subsequently described a variety of operations mostly through the groin but subsequently through a number of abdominal incisions over the next one hundred and fifty years. Treves the British surgeon recently returned from military service in South Africa achieved fame by operating on King Edward VII, on a table in the music room at Buckingham Palace.[2] Treves, assisted by Lord Lister, drained the King's appendix abscess and left the wound open. The King recovered and the next day was found "sitting up in bed and enjoying a fine cigar." This was part of routine postoperative respiratory care at the time. The King recovered and was crowned in August 1902 a mere fortnight after his surgery. The King had been a proponent of non-operative management (NOM) of acute appendicitis. He had opposed surgery as he felt it was risky in light of his impending coronation. Treves, who understood the importance of surgical management for this condition, retorted that if he did not operate, the empire would be holding a royal funeral rather than celebrating a coronation. His sanguinity was justified by the King's subsequent recovery. Treves's wisdom and sagacity was borne out when in 1923 at the age of 70 in Switzerland, he himself succumbed to peritonitis, believed to be due to acute appendicitis. The rapid progress of anaesthesia in the first half of the twentieth century made surgery for acute appendicitis an even more attractive option.

The next major break-through was the observation by the Scottish bacteriologist, Alexander Fleming, in 1928 that a mould inhibited the growth of *Staphylococcus aureus* in a contaminated petri dish, which had accidentally been left out over a long weekend.[3] This mould was identified as *Penicillium notatum.* The realisation that it produced a substance capable of inhibiting the growth of bacteria led to efforts to extract and purify this substance, and to eventually commercialise its production. This began just prior to and during the Second World War and in the post-war period modern antibiotic therapy became widely available.

The three pillars of effective treatment of acute appendicitis were now in place. These were safe anaesthesia, thorough surgical understanding and technique, and effective antibiotic treatment. Appendicectomy for acute appendicitis to this day remains one of a handful of operations that can be said to be definitively curative and effective. It can be performed safely, with minimal morbidity and can almost guarantee complete and lasting cure. The developments since the middle of the last century have been refinements on the surgical approach and include the laparoscopic approach first performed, like so many other surgical innovations, by a gynaecologist. Semm, a German gynaecologist, performed this breakthrough procedure in September 1980.[4] He was rewarded with opprobrium, indignation and moral outrage. He and his operation were soundly censured. Attempts to publish the operation were met with outright hostility and rejection. He was accused by the American Journal of Obstetrics and Gynaecology of unethical behaviour and the president of the German Surgical Society demanded Semm be struck off. Colleagues at the University of Kiel, forced him to undergo a brain scan, as they all felt that "only a person with brain damage would perform such laparoscopic surgery". In 1985 Erich Mühe applied Semm's laparoscopic approach to cholecystectomy. Forty-five years later the laparoscopic approach in surgery is regarded as the gold standard.

Ironically, just when it seemed that surgery had triumphed, at the turn of the millennium, surgeons in high-income countries began to undermine an operation as the pillar of care for appendicitis. A plethora of reports began

to emerge suggesting that conservative management, consisting of imaging and antibiotics could effectively treat acute uncomplicated appendicitis. Over the last quarter of a century, there has been a great deal of research on the role of NOM of acute uncomplicated appendicitis.[5] The COVID related shut-downs seemed to add a degree of urgency to these studies, as there was limited access to operating facilities during this period. There is now good evidence that antibiotic therapy can successfully treat acute uncomplicated appendicitis in 60–70% of cases. There remains a concern about a relatively high rate of recurrence, with some authors reporting five-year recurrence rates in the order of 18–30%. NOM is most effective for early, uncomplicated appendicitis, identified with a combination of clinical scoring systems and modern imaging. The non-operative approach may produce cost savings due to reduced use of operating room facilities and there is no risk of surgical related morbidity. This includes early complications such as wound sepsis and the often overlooked long-term complications of surgical adhesions, adhesive small bowel obstruction and abdominal wall hernias. Whilst it seems the outcome in terms of pain and recovery is equivalent for non-operative and operative groups, there is a longer length of stay in the non-operative group. This may offset some of the cost savings achieved by reduced use of operating room facilities.

Despite these positive developments, acute appendicitis remains an enigmatic disease. The rise of global surgery with its focus on comparing outcomes between rich and poor countries has highlighted the global burden of acute appendicitis.[6-9] Researchers have shown that despite the triumph of modern healthcare in turning what was once a fatal and morbid disease into a relatively innocuous one, systems failures mean that the global burden and impact of this disease remain daunting. The story of acute appendicitis in South Africa reflects this history. As a land of contrasts with huge discrepancies in wealth and access to care, we see the full spectrum of acute appendicitis. This ranges from low-grade disease treated with the best modern technology available, consisting of early recognition, appropriate imaging, laparoscopic surgery, as well as safe anaesthesia and after care including effective antibiotics, to advanced neglected disease that would have been familiar to the early pioneers of a previous era. Contemporary authors in South Africa have repeatedly emphasised this contrast and highlighted that in South Africa acute appendicitis remains a disease associated with massive morbidity and significant mortality. The failings in the South African health system result in delayed recognition, referral and surgery and translate into a disease profile very different to that currently seen in the developed world.[6-11] Whilst there may be a role for NOM in the private sector it seems unlikely that in the current setting non-operative strategies can be safely adopted in South African state hospitals.[12,13]

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