PAEDIATRIC LESSONS FROM THE PAST

Not just an appendix: Sir Frederick Treves

P Mirilas, J E Skandalakis

The history of the anatomy and surgery of the appendix is a beautiful chapter in medical education, and we appreciate the role of Sir Frederick Treves in its development.

In my library of classic medical literature, I (JES) am lucky enough to possess the 1881 Applied anatomy by Frederick Treves, FRCS (1853–1923). I call it, with great affection, “the little red book”. It is a true “handbook”, fitting comfortably in my outstretched palm. This book is full of anatomical pearls, such as the following about the appendix:

“The tip of the vermiform appendix may adhere to a neighbouring peritoneal surface, and thus form a ‘band’ beneath which a piece of the small gut may be strangulated. It is favourably placed for the accumulation of intestinal concretions and in it foreign bodies are apt to lodge. For these and other reasons it happens that ulceration of the appendix is a frequent cause of perityphlitis.”

In 1888, Treves described the possible positions of the appendix in the form of a clock face.

An appreciation of the illustrious life and great accomplishments of this master surgeon and anatomist is incomplete without a consideration of his role in the treatment of appendicitis. While Treves is a major figure in the history of knowledge about the appendix, he is not alone in the pantheon of medical genius. Proper perspective comes from further perusal of my bookshelf, which also contains a yellowing copy of the imposing tome by Kelly and Hurdon, which includes examples of great resistance to changing concepts, brilliant but unaccepted early observations, emotional support for unsupported views, the importance of timing, and, finally, the development of a highly satisfactory solution.

When to treat appendicitis has been as contentious an issue as how to treat it. Moore’s vignette of the surgeon John Homans and the great pathologic anatomist Reginald Heber Fitz illuminates the issues:

“Homans operated upon an 11 year old boy on the fifth day of his disease. A very early appendiceal abscess was found and drained. Recovery was gratifying. ‘Early operation’ was stressed (again for abscess drainage) but the concept of removing the appendix prior to perforation was not recognized at all. Homans reported the case before the Suffolk District Society on April 19, 1886, with both pride and charm, politely doffing his hat to the referring physician whose early diagnosis made it possible. One cannot help but wonder if Dr. Homans’ colleague Dr. Fitz was in the audience, and equally politely, holding his counsel and avoiding premature release of his concept that Dr. Homans’ little patient was truly operated on quite late in the disease.

Fitz’s report in 1886 in the American Journal of Medical Sciences constitutes a classic example of the pathologist pointing the way for the surgeon. He read his paper on June 18, 1886, before the American Association of Physicians, just two months after the Homans paper in Boston. He clearly visualized the difference between early operation on appendicitis and early drainage of an abscess. He stated a simple catarhal appendicitis is to be recognized anatomically but it is doubtful whether its clinical appreciation is possible. This appendicitis, in the absence of a concretion of foreign body, may progress towards ulceration and even to peritonitis which may terminate fatally. Fitz then went on to point out the signs and symptoms of early appendiceal involvement. He decried the habit, then becoming current, of waiting for a visible mass and fluctuance to appear before operation. He pointed out clearly that the second, third and fourth days were those in which peritonitis began. He analyzed the time of death from peritonitis and found over half the patients died in the first week. The homily ... that ‘if it is appendicitis, it is ruptured in four days’ finds its origin in Fitz’s original description.”
Incision and evacuation for cases of "typhilitis" and "peri-
typhilitis", conditions ascribed to inflammation of the cecum
and surrounding areas, evolved over time to actual removal of
the appendix. Shepherd gave an excellent overview of the
shift in diagnostic focus from the cecum to the appendix.

The history of appendectomy (appendicectomy in Britain)
is fascinating. Claudius Aymand removed an appendix
containing a calcified mass surrounding a pin in 1735 or 1736.
Both Ellis' and Williams' took pains to qualify this appendec-
tomy as occurring as part of surgical correction of an inguinal
hernia and faecal fistula. Richardson reported, "When
[Aymand] opened the scrotum he found the appendix in this
unusual position and moreover, that the appendix was perfor-
ated by a pin. He removed the appendix and then dealt with
the hernia and fistula."

Advances in anatomic and pathologic knowledge were
joined by the twin breakthroughs of anaesthesia and antise-
sis. Lawson Tait removed an inflamed but intact appendix in
1880. He reported the following: "A large abscess which
extended deeply down towards the brim of the pelvis and
lying bare in the cavity was the vermiform appendix ... it was
black and discolored and gangrenous. I therefore snipped it
off, and inverted the stump into the cavity, stitching the
inverted peritoneal surfaces together with fine silk, then
fastened a drainage tube into the pelvis and closed the
wound." The report of this successful surgery was not
published until 1890. Abraham Groves removed an inflamed
appendix in 1883, but no report occurred until his 1934
autobiography. Charles McBurney, who published the results
of an 1888 surgery in 1889, was thus not erring by stating,
"This is, I believe, the first recorded case where an acutely
inflamed unruptured appendix has been removed full of pus".4

In an address presented in 1884, Johannes von Mikulicz
advocated surgery for non-traumatic perforations of the
appendix.5 Ulrich Kronlein performed a coeliotomy with
removal of the appendix that same year (report published in
German in 1886). Treves operated on a chronically affected
appendix on 16 February 1887 (report published in 1888).6
George Thomas Morton, whose brother and son both died of
appendicitis, excised a partially perforated appendix on 27
April 1887 (report published in The Philadelphia Medical News
in 1887).7

Treves wrote the following letter, which was published on 5
November 1892 in the Philadelphia Medical News:

"I have just read with interest a leading article in the
Medical News for August 6 on the matter of operative
treatment of the vermiform appendix. The fact that I live
in a remote island, and further that a holiday of two
months has taken me away from the haunts of books,
must explain this tardy allusion to that paper.

The article discusses the origin of the operation for
removing the vermiform appendix, and it is stated that
to Dr. Thomas G. Morton belongs the credit of first
devising this procedure; the suggestion is also made
that the operation should be called 'Morton's operation,' and it is asserted that Morton's operation
embodies one of the most important and radical
advances of modern surgery. Dr. Morton thus becomes
the founder of what will, I suppose, be known as
'Appendicectomy,' should the present love for
riddling terms survive.

I gather that Dr. Morton's first operation was
performed in 1888, and was reported in the
Philadelphia County Society's Transactions for that
year. The nature of the transaction is not stated. Who
first excised the appendix some musty and forgotten
tome will no doubt reveal in the course of time ... In
1886 a patient with relapsing typhilitis came under my
care at the London Hospital, and after due
consideration, I proposed to 'deliberately seek for and
remove his appendix.' I operated on him during a
period of apparent health, on February 16, 1887, and
was able to correct the distortion of the appendix
without removing it. He made a perfect recovery. On
September 19, 1887, I brought the matter before the
Royal Medical and Surgical Society. The paper was
read in February, 1888. I advised the treatment of
selected cases of relapsing typhilitis by the deliberate
removal of the offending appendix during a quiescent
period. The proposal was not well received. In due
course, however, an exuberant reaction took place,
and of late appendices have been removed with a
needless and illogical recklessness which has brought
this little branch of surgery into well-merited disrepute.

Discussions on questions of priority constitute the
most pitiable and petty items in the literature of
medicine. The object of the letter is merely to bring up
from oblivion an unpretending paper which lies buried
in the annals of an ancient society.

Believe me to remain, yours faithfully,

FREDERICK TREVES"

In a thoughtful analysis, Kelly and Hurdon concluded:

"As a matter of fact, neither Morton nor Treves is
entitled to the distinction of first removing the appendix,
since Kronlein ... made the diagnosis and performed
the operation in February, 1884, and published the
account in 1886. ... Any claim to priority in medicine or
surgery always rests by the consent of the profession
not upon the date of performance, but upon date of
publication. Reflection will only confirm this dictum by
showing that the printed word is, after all, the only
possible arbiter which can be generally appealed to
and accepted when disputes arise. Moreover, in the
particular case in hand, the operations done, although
having the same organ in view, were essentially
different—one was purely orthopedic and the other
executive; it is the difference between a plastic
operation upon a limb and an amputation; therefore, in
view of this fact alone, no conflicting claims as to
priority can be raised."

Treves was not one to seek glory. Steinke and Zellweger
provided insight into his character in their thorough history
of Richter's hernia:

"Treves credited Richter with the distinction of having
given the first scientific description of this particular
lesion and suggested the term Richter's hernia, (partly)
because with Richter must rest the main credit of
establishing the individuality of this lesion.13

Treves' unparalleled scholarly contribution to the sub-
ject remains, after more than a century, the cornerstone
of modern understanding. Not only did he provide a
detailed clinical description based on his own surgical
experience, but he also exhaustively treated the topic by
citing 52 authors since 1606 in his analytic and histori-
cal review of the subject. He then modestly proposed
Richter, not himself, as deserving eponymous recognition
for this hernia. All of this exemplifies his honest and sci-
entific approach to research and medicine."
Gibbs stated, “It was especially in the field of abdominal surgery that Treves excelled and made lasting contributions. It is unlikely that anybody, before or since, has prepared himself more thoroughly with knowledge of abdominal anatomy, both in comparative and human anatomy.” Treves performed the first curative operation for megacolon in a 5 year old child. As Howard reported, “Although there was massive dilatation of the proximal colon, the lower sigmoid colon and rectum were narrow. He performed an abdominoperineal resection of the distal colon and rectum with anastomosis of the proximal colon to the anal margin. The patient was known to survive at least until 67 years of age.” Treves was the first to report caecal bascules.

Two inconstant folds of peritoneum have been called “Treves’ folds”. The ileocaecal fold is known by the eponym “Treves’ bloodless fold”. On several occasions, the senior author (JES) has seen minute blood vessels travelling in this fold. Therefore, we advise our residents to exercise extreme care in ligating both the ileocaecal and ileocolic folds to avoid postoperative haematoma. As Kelly and Hurdon point out, the ileocaecal fold is bloodless “in the sense that its origin was not determined by blood-vessels, as in the case of the ileocolic fold”.

A witty writer and lover of precision in language, Treves’ texts are still enjoyable reading. He wrote of the caecum, “In herbivorous animals it is of great size, and appears to serve as a reservoir for the elaboration and absorption of food, since its removal causes great emaciation. In man, therefore, the caecum, which has been said to exist as an anatomical protest against vegetarianism”. Concerning the sigmoid flexure, Treves stated, “This loop, when unfolded, describes a figure that, if it must be compared to a letter, may well be compared to the capital Omega”. He reserved special scorn for a Latin-Greek portmanteau word used by American doctors: “One knows that the academical-minded have a great objection to this uncouth term ‘appendicitis’; it lacks precision, but it has found its place in the clumsy nomenclature of medicine, and has been accepted by the public with an extraordinary amount of generosity.”

Treves was 35 years old on 29 June 1888, when he first removed a chronically affected appendix. He couched his reasoning for recommending surgery more in terms of typhilitis than appendicitis:

“Typhilitis is very liable to relapse ... I am under the impression that the great majority of examples of relapsing typhilitis are due to troubles in the appendix; indeed, the diverticulum affords anatomical reasons for relapse that are not provided either by the caecum or by the peritoneum. A simple local peritonitis shows no disposition to relapse, nor are there circumstances in those lesions of the caecum that lead to typhilitis which will readily explain frequent attacks of inflammatory trouble.”

Adamant to the point of dogmatism about circumstances and timing of surgery of the appendix, in 1889 Treves proclaimed the value of “interval” surgery: “The operation should not be performed until all inflammatory and other symptoms have quite subsided.” He championed delayed treatment even for a first acute attack: “A case of death from perforation within thirty-six hours of the appearance of the symptoms of typhilitis does not afford a legitimate argument for the routine performance of an operation within that period in even the majority of cases”.

By 1901, Treves had removed a thousand appendices. Yet an appendicitis that progressed to peritonitis claimed Treves’ daughter Hetty in 1900, despite his belated surgical intervention.

Treves’ most famous surgery is undoubtedly his treatment of the appendicular abscess of King Edward VII. Edward’s bouts of pain in the lower right abdomen began less than two weeks before his scheduled coronation on 26 June 1902. Treves examined the prince on 18 June and continued with daily visits. During this period of relative quiescence, Treves presented a major address on appendicular inflammation. As his pain waxed and waned, Edward resisted all counsel for surgical intervention, attending a banquet on 23 June. By the next morning, he was gravely ill.

Ellis described the dramatic scene in Buckingham Palace:

“It fell to Lister to explain to the King that his medical advisers all agreed that an operation was urgently necessary. Edward, steeped in the tradition of service to his people, refused: ‘I must keep faith with my people and go to the [Westminster] Abbey for the coronation.’ This he repeated over and over again as his doctors did their best to persuade him. Treves realized that the time had come to speak frankly, and when the King reiterated, ‘I must go to the Abbey’, Treves finally said, ‘Then, Sire, you will go as a corpse.’ At this the King agreed to submit to surgery.”

After draining the appendicular abscess in a hastily assembled operating theatre, Treves spent seven sleepless days and nights caring for the king. Edward was crowned on 9 August 1902. Williams’ summary is apt: “Appendicitis thus became well known in Edwardian London, and appendicectomy rapidly was accepted by English surgeons, even though the royal appendix remained in situ.”

Sir Frederick Treves was already a Companion of the Order of the Bath and a Knight Commander of the Royal Victorian Order in 1902. For his service, he gained a baronetcy, and appendicectomy became well known in Edwardian London, and appendicectomy rapidly was accepted by English surgeons, even though the royal appendix remained in situ.”

The description of the renewed Treves family crest with its symbol of royalty (the rampant lion) is as rich in technical terminology and detail as the finest topographic anatomy:

“His arms were blazoned: ‘Argent, a cross couped gules, thereon a tower tripled turreted Or, in the first and fourth quarters a dexter hand appaume proper, and in the second and third quarters a tent proper; and for honourable augmentation, on a chief gules, a lion passant guarant Or, armed and langued azure’ [being one of the lions from His Majesty’s Royal Arms].”

Wangensteen and Wangensteen give us a final glimpse of Treves:

“Treves developed an enormous private surgical practice and abandoned his hospital appointment at the London Hospital at age forty-five. At age fifty-five he withdrew completely from surgery to devote himself to travel. He died from peritonitis at age seventy-two in a Lausanne nursing home. Unfortunately a postmortem examination prior to cremation was not performed. Could incomplete cecal descent, a clinical entity identified by Treves, attended by appendiceal
obstruction have accounted for the peritonitis that took his life? It has been suggested that the peritonitis was biliary in origin. But certainly rupture of the appendix is a far more frequent cause of peritonitis than is cholecystitis."

Delightfully, there is an “appendix” to the story of Treves in the case of contemporary patient EMG, published in 2000 by Lavelle:"

“Treves’ young patient
EMG will be 100 years old this month. She is both a friend and a former patient. I first met her as a friend in 1984, and in 1993 I found myself operating on her for gallstones. Laparoscopic surgery had arrived, and so I performed a laparoscopic cholecystectomy. Preoperatively, she mentioned that she had had her appendix removed as a child, and as a routine I asked her the name of the surgeon. ‘Treves—Frederick Treves’, she said. It turned out that she had had her appendix removed at home in Ealing at the age of 6 (in 1906). Her father was well off and was able to command the services of a surgeon in his home, rather than allowing his child to be taken to the local hospital. At that time, the operation of appendicectomy was still not commonly performed, but it had gained in popularity when Sir Frederick Treves had operated on the Prince of Wales in 1901, [sic] the night before his coronation, and drained an appendix abscess that had been brewing for several days. The coronation had to be postponed, but the Prince of Wales survived to be crowned King Edward VII. Treves is also remembered today for his role in studying and looking after ‘the Elephant Man’.
EMG remembers waiting for Treves to arrive, and she remembers a table being taken upstairs to one of the bedrooms for the operation. She then remembers that after the operation she was in bed for three weeks. During that time, she had a day nurse and a night nurse, and her mother was not allowed to see her at all. In fact, her mother peeped through the keyhole one day and when the nurse found out about this she stopped up the hole. EMG remembers having regular dressing changes, and this was a very painful business. The local doctor supervised the dressings, and if EMG behaved herself—that is, she didn’t scream the place down—he left a penny on the mantelpiece. After three weeks, she was allowed out in a push chair [wheelchair] and had to suffer the taunts of the local children. At about the same time, EMG remembers that another child of her age developed appendicitis and went to the local hospital, but died in hospital.
When I performed EMG’s laparoscopic cholecystectomy in 1993, I was able to visualise the caecum and thus see the results of Sir Frederick Treves’s handiwork. She had a large incision in the right iliac fossa, which would have been necessary in prerelaxant days to gain access to the appendix."

As Gibbs" so aptly stated, “Sir Frederick Treves was a man of many-sided genius and widely varied achievement ... There is much evidence that Treves saw himself as a participant on the stage of history ... He had lived through a remarkable period of change in surgical practice ... When he started as a student many aspects of surgery had scarcely changed since medieval times.” The history of the anatomy and surgery of the appendix is a beautiful chapter in medical education, and we appreciate the role of Sir Frederick Treves in its development.

Authors’ affiliations
P Mirilas, J E Skandalakis, Emory University School of Medicine, Atlanta, GA, USA

REFERENCES