

# Not just an appendix: Sir Frederick Treves

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Arch Dis Child 2003;88:549–553

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.

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<sup>6</sup>:

In my library of classic medical literature, I (JES) am lucky enough to possess the 1881 *Applied anatomy* by Frederick Treves, FRCS (1853–1923).<sup>1</sup> 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 strangled. 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.<sup>2</sup>

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, *The vermiform appendix and its diseases*.<sup>3</sup> I like to look back at 1905, when the authors could write, "aggressive surgery of the vermiform appendix as practised to-day is only a development of the past twenty years". In prose that is expansive but never discursive, Kelly and Hurdon show how the ancient practice of incision and evacuation of blood and pus in the abdominal cavity evolved over time with an awareness of the existence and maladies of the appendix.

Williams<sup>4</sup> stated, "The history of appendicitis includes examples of great resistance to changing concepts, brilliant but unaccepted early observations, emotional support for unsupportable views, the importance of timing, and, finally, the development of a highly satisfactory solution."

Acute appendicitis was described by Wilhelm Ballonius in 1734. James Parkinson (1775–1824) described peritonitis as an important complication of acute perforated appendicitis.<sup>5</sup>

"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 catarrhal 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."

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Accepted  
26 October 2002

Incision and evacuation for cases of “typhlitis” and “perityphlitis”, conditions ascribed to inflammation of the caecum and surrounding areas, evolved over time to actual removal of the appendix. Shepherd<sup>7</sup> gave an excellent overview of the shift in diagnostic focus from the caecum to the appendix.

The history of appendectomy (appendicectomy in Britain) is fascinating. Claudius Amyand removed an appendix containing a calcified mass surrounding a pin in 1735 or 1736. Both Ellis<sup>8</sup> and Williams<sup>9</sup> took pains to qualify this appendectomy as occurring as part of surgical correction of an inguinal hernia and faecal fistula. Richardson<sup>10</sup> reported, “When [Amyand] opened the scrotum he found the appendix in this unusual position and moreover, that the appendix was perforated 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 antiseptics. 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.<sup>3</sup> Abraham Groves removed an inflamed appendix 1883, but no report occurred until his 1934 autobiography.<sup>4</sup> 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”.<sup>8</sup>

In an address presented in 1884, Johannes von Mikulicz advocated surgery for non-traumatic perforations of the appendix.<sup>3</sup> Ulrich Kronlein performed a coeliotomy with removal of the appendix that same year (report published in German in 1886).<sup>3</sup> Treves operated on a chronically affected appendix on 16 February 1887 (report published in 1888).<sup>3</sup> George Thomas Morton, whose brother and son both died of appendicitis,<sup>11</sup> excised a partially perforated appendix on 27 April 1887 (report published in *The Philadelphia Medical News* in 1887).<sup>3</sup>

Treves wrote the following letter, which was published on 5 November 1892 in the *Philadelphia Medical News*<sup>3</sup>:

“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 ‘Appendiceal Surgery,’ should the present love for ridiculous 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 dusty and forgotten tome will no doubt reveal in the course of time ... In

1886 a patient with relapsing typhlitis 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 typhlitis 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<sup>3</sup> 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 exsective; 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<sup>12</sup> 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.<sup>13</sup>

Treves’ unparalleled scholarly contribution to the subject 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 historical 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 scientific approach to research and medicine.”

Gibbs<sup>14</sup> 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<sup>15</sup> 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.<sup>16</sup>

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".<sup>3</sup>

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 has been said to exist as an anatomical protest against vegetarianism".<sup>1</sup> 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".<sup>17</sup> 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".<sup>18</sup>

Treves was 35 years old on 29 June 1888, when he first removed a chronically affected appendix.<sup>11</sup> He couched his reasoning for recommending surgery more in terms of typhlitis than appendicitis<sup>19</sup>:

"Typhlitis is very liable to relapse ... I am under the impression that the great majority of examples of relapsing typhlitis are due to troubles in the appendix; indeed, that 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 typhlitis 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".<sup>20</sup> 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 typhlitis does not afford a legitimate argument for the routine performance of an operation within that period in even the majority of cases".<sup>21</sup>

By 1901, Treves had removed a thousand appendices.<sup>22</sup> Yet an appendicitis that progressed to peritonitis claimed Treves' daughter Hetty in 1900, despite his belated surgical intervention.<sup>23</sup>

Treves' most famous surgery is undoubtedly his treatment of the appendiceal 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 appendiceal inflammation.<sup>18</sup> 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<sup>22</sup> 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 appendiceal 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<sup>24</sup> 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 achieved augmentation of his coat of arms. Harrison<sup>25</sup> gave this description of the latter achievement:

"Augmentation is a special mark of honour usually from the Sovereign ... granted by royal warrant under the hand of the Privy Seal for great service to the Sovereign or the state. Few medical practitioners have been so honoured ..."

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 Wangenstein<sup>26</sup> 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<sup>27</sup>:

“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 appendectomy 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 pre-relaxant days to gain access to the appendix.”

As Gibbs<sup>14</sup> 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.

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