A surgical review of the priority claims attributed to Abraham Groves (1847–1935)

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Background: The practice of surgery had changed little over millennia when Abraham Groves and William Osler attended medical school together in Toronto, Ontario. The invention of anesthesia sparked such rapid development that by the time of Groves’ and Osler’s deaths, surgical practice resembled the current model. Several priority claims have been attributed to Groves’ life in surgery, including aseptic surgery (1874), suprapubic lithotomy (1878), appendectomy (1883), surgical gloves (1885) and cancer radiotherapy (1903). These claims arise from an autobiography written by Groves at the age of 87 years in 1934.

Methods: The purpose of this paper is to assess these priority claims from a modern surgical perspective. We did a systematic search of contemporary (1873–1934) and modern journals for articles by or about Groves. We searched relevant archives and museums. We reviewed the 1934 autobiography, notes held by descendants, reminiscences by contemporaries and collateral information. We assessed the information not only for priority but also for the development of organized surgical thought.

Results: Groves published frequently throughout his career; thus far we have located 36 papers, almost all of which were published in Canadian journals. He spoke regularly at regional meetings in Ontario. Many medical students apprenticed with him (including his brother, son and grandson), he established a hospital and he founded a school of nursing. His contemporaries published complimentary reminiscences, but no correspondence with his classmate, William Osler, is known. Groves’ priority claims for aseptic surgery, suprapubic lithotomy and radiotherapy are supported by contemporary publications. Groves independently developed an organized surgical system that remains valid today. Priority claims for appendectomy and the use of surgical gloves are entirely consistent with that system.

Conclusion: Although Groves’ impact was reduced by his location and the limited circulation of the journals in which he wrote, he demonstrated a systematic understanding of modern surgery well ahead of his contemporaries.

Contexte : La pratique de la chirurgie avait peu changé au fil des millénaires lorsque Abraham Groves et William Osler ont fréquenté ensemble la Faculté de médecine à Toronto (Ontario). L’invention de l’anesthésie a déclenché un progrès tellement rapide qu’au moment de la mort des Docteurs Groves et Osler, la pratique de la chirurgie ressemblait déjà au modèle actuel. On a attribué plusieurs premières en chirurgie au Docteur Groves, y compris la chirurgie en condition d’asepsie (1874), la lithotomie sus-pubienne (1878), l’appendicectomie (1883), les gants chirurgicaux (1885) et la radiothérapie contre le cancer (1903). Ces premières sont mentionnées dans une autobiographie rédigée par le Docteur Groves à l’âge de 87 ans, en 1934.


Résultats : Le Docteur Groves a publié fréquemment tout au long de sa carrière : jusqu’à maintenant, nous avons trouvé 36 communications, presque toutes publiées dans des journaux canadiens. Il a pris régulièrement la parole au cours de rencontres régionales en Ontario. Beaucoup d’étudiants en médecine ont reçu leur formation à ses côtés (y compris son frère, son fils et son petit-fils), il a créé un hôpital et fondé une école de soins infirmiers. Ses contemporains ont publié des souvenirs élogieux, mais on ne
In an article published in this journal in 1961,1 C.W. Harris asked if Abraham Groves (1847–1935), a physician practising in the village of Fergus, Ont., was the first to perform an appendectomy for previously diagnosed appendicitis. The article was the first of 3 written by Harris on important late 19th–century Canadian surgeons, the other 2 being W.T. Aikins (1827–1897)2 and I.W. Cameron (1855–1933),3 both professors of surgery in Toronto, Ont. Together, these well researched and finely written articles provide a vivid glimpse of Victorian surgery in Canada. The article on Groves is fascinating in another respect: Harris wrote that the actual appendix removed by Groves still existed and that modern histologists had examined it.

At the age of 87 in 1934, Abraham Groves (Fig. 1) published a memoir of an exceptionally long career as a surgeon in Canada. His purpose was “to preserve records of some of the earliest operations” that he believed had not been performed before and “to set forth important theories which [he thought] would improve some of the modern methods in present-day medical practice.”4 Detailed information regarding the time, place and presence of witnesses was included in his report of the events. In May 1874, before his first laparotomy, both Groves and his assistant, John Wishart, thoroughly scrubbed their hands with previously boiled water and used only instruments and sea-sponges that had been boiled in water. Groves continued to employ these precautions throughout his career as well as developing systems to wash the patient’s skin preoperatively and to irrigate the bladder for urological procedures. Laparotomy was completed by copious irrigation with sterile water. This would be the first time that the aseptic surgical technique was consistently applied. On May 10, 1883, he performed an appendectomy on a 12-year-old boy with acute appendicitis; this would be the first such operation performed in North America. In November 1885, he used sterilized rubber gloves to perform an appendectomy in a patient with purulent peritonitis to prevent transfer of infection to other surgical patients. This would be first use of surgical gloves for infection control, 5 years before Halsted’s use of gloves to protect against the corrosive effect of carbolic scrub. The autobiography detailed several operations that might represent North American or Canadian priority including vaginal hysterectomy (Sep. 10, 1875), suprapubic lithotomy (Apr. 20, 1878), prostatectomy (not dated) and radiotherapy (1903). Groves’ autobiography was an author-paid publication of 500 copies in 1 edition and, as such, had a very limited circulation, despite positive reviews from the Lancet and the British Medical Journal.

Twenty years after Harris’ article,1 a historical review of appendicitis by Andrew Seal,5 also in this journal, suggested that Groves should be remembered for the first appendectomy in North America. Both authors issued a note of caution because Groves’ autobiography was written 60 years after some of the events it described. Despite the cautious approach to validation taken by these and subsequent authors6,7 the claims have gained currency through repetition.

**METHODS**

The purpose of this paper is to assess priority claims attributed to Abraham Groves from a modern surgical perspective.
We did a systematic search of contemporary journals (1871–1935) for articles by or about Groves. We searched the collections of the Wellington County Museum, Archives of Ontario, University of Toronto, University of Western Ontario, the Museum of Healthcare at Kingston, the Osler Library at McGill and the Osler Collection at Johns Hopkins University, as well as contemporary newspapers from Fergus and Toronto. We reviewed the 1934 autobiography, notes held by descendants, reminiscences by contemporaries and collateral information. We assessed the information not only for evidence of priority but also for the development of organized surgical thought.

**RESULTS**

We found Index Medicus and journal indices to be incomplete. Thus far we have located 36 articles published by Groves, of which 5 are duplicates. These publications, which cover a very wide range of surgery, are mostly summaries of lectures given to medical societies, frequently the Ontario Medical Association. Most of his papers were published in the *Canad. Lancet* and the *Dominion Medical Monthly* from Toronto, and in the *Montreal Medical Journal*. Groves also appeared in short-lived Canadian journals such as the *Canadian Practitioner, Canadian Medical and Surgical Journal* and *Canadian Practice and Review*. These journals often duplicated each other’s articles for their respective audiences until they were superseded by the *Canadian Medical Association Journal (CMAJ)* in 1911. Groves, who was 64 years old at the time, disappeared from view. In 1921, he spoke at the Ontario Hospital Association annual meeting. *Toronto Star* reporter Frederick Griffin was taken by the quick-footed 75-year-old, who he heard was still an operating surgeon. A portrait that appeared in the newspaper lead to an invitation from the *CMAJ* to write a review of his career. The review formed the basis of his memoir 12 years later. Another 2 original case reports to *CMAJ* complete Groves’ writing career, which spanned a remarkable 60 years.

The largest collection of materials and artifacts from Groves’ career are held by the Wellington County Museum. A common book kept by Groves throughout his life, autobiographical notes and Ontario public health materials used by him are in the Archives of Ontario. Although a 1926 edition of Osler’s *Principles and Practice of Medicine* inscribed by Groves is among books held by the Wellington County Museum, no record of correspondence between the two Toronto School of Medicine classmates has been located. An amputation knife with evidence of frequent boiling is in the collection of the Dittrick Museum in Cleveland, Ohio. The museum has verified the knife was manufactured in England in 1870, which is consistent with Groves’ claim regarding aseptic surgery. Groves kept the appendix and stones from his first operations as trophies that were displayed in his hospital in Fergus. His widow donated the appendix in 1961, and her estate gave the stones in 1965 to the Toronto Academy of Medicine. Curator Felicity Pope told us that the appendix was contained in an authentic 19th-century container, the contents of which were almost invisible because the wine-spirit preservative had become cloudy. The academy considered sending the specimen to the Hunter Museum in England because it had the only experience of restoring 19th-century specimens. Mr. Penz, a technician with the William Boyd Museum at the Banting Institute, thought he could clean the specimen, but the glass container was damaged and could not be saved. The opportunity was taken to make a paraffin-fixed section of the base of the appendix, which was then placed in a modern bottle. With the divestment of the Toronto Academy of Medicine’s assets in 1999, the appendix was transferred to the History of Medicine collection at the Toronto General Hospital. Following the closure of this collection in 2002, we can find no trace of Groves’ appendix or stones. One explanation given was that the material was destroyed because no patient consent for storage was available.

**DISCUSSION**

Abraham Groves was born on Sep. 8, 1847, to an Irish family in Peterborough, Ont., 35 miles from the birthplace of William Osler (1849–1919). When Groves was 5 years old, the family moved to a farm beside the small Ontario town of Fergus. Groves attended the Toronto School of Medicine from 1867 to 1871, where he registered 1 year ahead of Osler. Records for the 1869/70 session were rediscovered in the 1940s and studied because of the fame later achieved by Osler. Although there were weaknesses in the clinical training available in Toronto, teaching in anatomy by J.H. Richardson was said to be superb. Both Groves and Osler admired and were influenced by James Bovell, lecturer in physiology, and William Thomas Aikins, who taught surgery. Bovell inspired his students to imagine future developments in medicine; the vision that laparotomy might help diagnosis was the thought that struck Groves most forcefully. Despite this, no abdomen was ever opened while Groves was in Toronto. Aikins, who was particularly adept at orthopedic and soft-tissue surgery, was an early proponent of listerism, but he was not above using his mouth to hold instruments that might be needed later in an operation. Feuding between different schools of medicine in Toronto, and a funding crisis that caused the closure of the Toronto General Hospital for the year in 1868 induced Osler to leave for Montréal, Que., and Groves to hastily complete his apprenticeship. Osler and Groves took their Ontario licensing examinations in 1871, 1 year after a profound change had occurred in the examination. Chief examiner Michael Sullivan from Kingston, Ont., had ordered all students to be examined at the
anatomy table, lessening the emphasis on theoretical medicine in favour of standard core knowledge. We believe this emphasis on anatomy and physiology created an environment that permitted innovators like Osler and Groves to thrive.

The claim that in 1874 Groves was the first to consistently use aseptic surgical technique is strong. It is supported by his contemporary account, has a sound theoretical basis and became his consistent practice. Groves reasoned that since typhoid was carried by water, infections after surgery might arise from infected fluids of the patient, the surgeon’s hands, the instruments or the sponges. He boiled the instruments and sponges, and he thoroughly washed the patient’s skin and his hands in sterilized water. Later on, he added small amounts of antiseptic solution to the water which had been sterilized by boiling. His practice is more like that of today than Lister’s, which emphasized airborne infection. Groves undoubtedly heard about Lister in Toronto, but Lister’s student, Archibald Malloch of Hamilton, Ont., did not introduce the carbolic spray to Canada until 2 years after Groves’ graduation and 1 year before his landmark operation.

The breadth of Groves’ practice as measured by his publications is astounding. Claims that he is a pioneer in Canada of what today are classified as general surgery, urology, gynecology and radiotherapy are supported by contemporary reports, valid developmental logic and persistent practice. His priority may extend to North America in areas such as urology. This record alone puts Abraham Groves far ahead of his distinguished contemporaries Aikins and Cameron. The theory behind Groves’ practice is entirely consistent with that outlined by Koch at the Tenth International Medical Congress in 1890. At this widely reported meeting, Lister issued a courageous retraction regarding the use of carbolic spray with the result that aseptic technique replaced antisepsis in surgery. In contrast, I.W. Cameron clung to listerism and remained reluctant to perform laparotomy.

We did not find contemporary reports to support Groves’ claims regarding the first appendectomy and the use of surgical gloves. Family records held by the Wellington County Museum suggest that John Wishart, Groves’ student in 1873 who became professor of surgery at the Western University of London, Ontario, also claimed to have performed the first appendectomy in 1885, 2 years after Groves’ claim. A self-written entry for Abraham Groves in the 1886 edition of Canadian Biography claims the first Canadian suprapubic lithotomy but does not mention appendectomy. In a report of 17 patients with appendix (perityphlitic) abscess in 1890, Groves was able to distinguish cases that would resolve spontaneously from those that required drainage, for which he recommended the posterior extraperitoneal route. He wrote a comprehensive review of appendicitis in 1903, in which we found the earliest reference to his appendectomy of 1883. In his 1934 memoir, Groves published a letter from Dr. E. Flath to support his use of sterile rubber gloves in 1885, but the dates are included in Groves’ account and not in Flath’s. Although Groves’ claims are entirely consistent with the system of surgery that he had developed, we cannot verify the year when he first started to use these procedures.

In 1948, Dr. G.D. Stanley, who knew Groves as a Toronto Medical School classmate of his son William and had confidence in the 1883 date of the appendectomy, wrote that Groves reported the operation soon after to a meeting of the Toronto Medical Society. He was condemned as a “backwoods doctor” who must be stopped. A written record of this meeting would verify the year of Groves’ claim. In 1907, the Toronto Medical Society was amalgamated with 3 other Toronto societies to form the Toronto Academy of Medicine. Unfortunately, records of the Toronto Medical Society, if they had survived the transfer to the academy, did not survive its closure. It may be that, like modern surgeons, Groves did not consider appendectomy or the use of gloves as surgical milestones until they achieved recognition later. We believe Abraham Groves should be remembered for the development of a comprehensive, logical system of surgery that remains valid today, 130 years after its inception.

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References
