

**BREAST LUMPECTOMY MARGINS**

There has been considerable literature on breast conservation therapy over the past few years, with an emphasis on cosmesis and less emphasis on the possible disadvantages of excision with inadequate margins at initial surgery.

Recent literature<sup>1</sup> suggests that 1 in 4 women who have had breast conservation therapy require a second operation to remove residual tumours, an improvement over the last few years, but still substantial. Recent literature<sup>1,2</sup> suggests that inadequate margins at initial surgery are disadvantageous for patients from a psychological and economic standpoint. There does not appear to be emphasis that having a positive margin at initial surgery negatively influences the likelihood of remaining disease free, although studies<sup>3,4</sup> have demonstrated that local recurrence after breast conservation surgery increases systemic disease, which can lead to increased mortality. It has been stated<sup>5</sup> that cancer cells have growth factor receptors that are compatible with growth factors in the wound environment and that cancer cells that shed intraoperatively can contribute to both local recurrence and distant metastases.

It is suggested that the cosmetic advantages of removing a specimen 1–2 cm smaller does not warrant the disadvantage of removing a specimen with inadequate margins, particularly since a second procedure negates the cosmetic advantage of removing a smaller specimen. Silverstein and colleagues<sup>6</sup> in discussing ductal carcinoma in situ made a comment that should also apply to lumpectomy for neoplasm: “the first excision is the best opportunity to achieve both goals, complete excision and good cosmetic result.”

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**JOSEPH LISTER: FATHER OF MODERN SURGERY**

On the centenary of Joseph Lister's death, it is appropriate to remember and honour his remarkable accomplishments that earned him the title “father of modern surgery.”

Conferences to commemorate “the greatest surgical benefactor to mankind” were held this year at King's College in London, England, and at the Royal College of Surgeons of Edinburgh, where speakers covered a wide range of relevant topics, including history, current research in surgical infection and health policy in Great Britain. Many of the presentations included quotes by or about Lister from his era, and those quotes remain relevant to modern surgery.

It was Lister's genius to take the work of Pasteur on the etiology of fermentation and envision this process as the same that was causing infection and gangrene. In the face of movements to abolish all surgery in hospi-

tals because of the prohibitive death rate from infection,<sup>2</sup> Lister changed the treatment of compound fractures from amputation to limb preservation and opened the way for abdominal and other intracavity surgery.

Born in Essex, England, to a Quaker family, his father was elected a Fellow of the Royal Society for his construction of the first achromatic lens and coauthored a paper with Thomas Hodgkin about red blood cells. Paternal guidance was a major influence throughout Lister's career.<sup>3</sup>

Lister was an excellent student at the University College of University of London and became house surgeon at University College Hospital where he attained Fellowship in the Royal College of Surgeons. On the advice of Professor Sharpely of physiology, he went to study under the renowned surgeon James Syme in Edinburgh. Lister prospered in Edinburgh and married Syme's eldest daughter, Agnes.

His main research interest was inflammation, a process then considered a specific disease and not a response by healthy tissues to infection. Lister did come to understand that inflammation caused loss of vitality, which rendered tissues helpless as if they were dead,<sup>4</sup> helpless against organisms he would eventually attribute as the cause of the devastating and feared surgical site infections. He published 15 papers about the action of muscles in the skin and the eye, the coagulation of blood and blood vessel changes with infection.

At 33 years of age, he was appointed Regius Professor of Surgery at the University of Glasgow, but it took him another year to get privileges at the Glasgow Royal Infirmary. His initial application was rejected by the Chair of the Royal Infirmary Board, David Smith, with the comment “But our institution is a curative one. It is not an educational one.”<sup>5</sup> Glasgow had twice the population of Edinburgh and was renowned for its “warm-hearted, voluble and uncritically friendly inhabitants,”<sup>6</sup> an ideal environment for a

young surgeon to embark on a new, unproven treatment regime.

The world of surgery when Lister began his practice was primitive by our standards. Although Fracastoro of Verona in 1546 theorized that small germs could cause contagious diseases,<sup>5</sup> no one associated them with wound infections. Bed linen and laboratory coats were not washed and surgical instruments were only cleaned before they were put away for storage. The same probe was used for the wounds of all patients during rounds to look for pockets of undrained pus. Suppuration and laudable pus were considered part of normal healing. Operative procedures were only occasionally performed in the average surgeon's practice,<sup>5</sup> and there was talk of banning all surgery from hospitals because of septic complications. Sir J.E. Erichsen, a future President of the Royal College of Surgeons, stated "The abdomen, chest and brain will forever be closed to operations by a wise and humane surgeon."<sup>6</sup> Semmelweis' work on puerperal fever was unknown.

Lister's interest in wound healing began when he worked as a dresser for Sir Erichsen. Erichsen believed the wounds were infected from miasmas that arose from the wound themselves and became concentrated in the air. Erichsen had deduced that more than 7 patients with an infected wound in a 14-bed ward led to saturation of the air and spread of the dangerous gasses causing gangrene. Lister was not convinced, as when the wounds were debrided and cleaned, some wounds healed. This sparked his suspicion that something in the wound itself was at fault.<sup>4</sup>

Lister's great intellectual breakthrough came when, on the advice of Thomas Anderson, a Glasgow professor of chemistry, he read Pasteur's papers, *Recherches sur la putrefaction*, and postulated that the same process causing fermentation was involved with wound sepsis.<sup>4</sup> Having heard of creosote being used to disinfect sewage, he applied carbolic acid compounds as an antiseptic on surgical wounds. Having observed the marked

difference in morbidity and mortality between simple and compound fractures, he postulated that infection came from exposure to the air in compound fractures without the protection of the skin. He began his antiseptic method with compound fracture wounds because the standard treatment of amputation was always available should his method fail.

The results of this new method of treating wounds were soon apparent, and it then did not "seem right to withhold it longer from the profession generally."<sup>4</sup> His work was initially published in 2 papers in the *Lancet*; the first in March 1867, the second in July of the same year.<sup>4</sup> At the Dublin meeting of the British Medical Association in August 1867, Lister stated "previous to its introduction, the 2 large wards in which most of my cases of accident and of operation are treated were amongst the unhealthiest in the whole of surgical division at the Glasgow Royal Infirmary (...) but since the antiseptic treatment has been brought into full operation, (...) my wards (...) have completely changed their character; so that during the last 9 months not a single instance of pyaemia, hospital gangrene or erysipelas has occurred in them."<sup>7</sup>

Lister made many alterations to his method of wound care, and the iconic carbolic acid spray was only 1 part of the evolution of antiseptics. The skepticism and opposition from some of his colleagues is legendary,<sup>8</sup> as was the enthusiasm when the positive results were evident in the patients. Germany led the way in adopting Lister's antiseptic technique, followed by the United States, France and lastly Great Britain.<sup>5</sup> Some of this opposition was understandable, as germs were too small to be seen in their microscopes, and Lister thought the air was the sole source of contamination. He received accolades and prestigious awards from many nations and was appointed a Peer in Great Britain.

Lister was only human, and history has duly recorded some imperfections. Although his students had the utmost respect and praise for him, collegiality

in Glasgow was a problem, and he neglected to share credit for his success with other members of the Glasgow team, to the great chagrin of the Royal Infirmary administration.<sup>8</sup> Harsh criticism of the system of medical teaching in London almost cost him his appointment to King's College Hospital at the peak of his career,<sup>1</sup> and he failed to support equality of women with men in medicine.<sup>9</sup>

Although asepsis and sterile technique have replaced antiseptics as the primary principle in combating infection, it was Lister's application of germ theory to the care of surgical patients that laid the foundation for what surgeons do now. He directed the minds of physicians and surgeons to the vital necessity of keeping wounds clean and free of contamination.

Joseph Lister remains an inspiration for surgeons today.

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