

"The Results of Operations for the Cure of Cancer of the Breast Performed at the Johns Hopkins Hospital from June, 1889, to January, 1894" (1894), by William Stewart Halsted

In 1894, William Stewart Halsted published "The Results of Operations for the Cure of Cancer of the Breast Performed at the Johns Hopkins Hospital from June, 1889, to January, 1894," in the medical journal *Annals of Surgery*. In the article, Halsted describes the results from fifty of his operations on women with breast cancer, performed at Johns Hopkins Hospital in Baltimore, Maryland. Those operations involved a surgical procedure Halsted called radical mastectomy, which consists in removing all of the patient's breast tissue, chest muscle, and underarm lymph nodes. Halsted's surgery effectively cured breast cancer in a time period when no other effective treatment options were available. The radical mastectomy remained the standard of care from the 1890s to the 1970s as a means of treating a type of reproductive cancer common to women.

Halsted wrote "The Results of Operations for the Cure of Cancer of the Breast Performed at the Johns Hopkins Hospital from June, 1889, to January, 1894", hereafter referred to as "Results of Operations," while he worked as a surgeon and professor of surgery at Johns Hopkins University in Baltimore, Maryland. At Johns Hopkins University, Halsted contributed new surgical procedures and techniques, such as using thin rubber gloves in the operating room and using plates and screws to secure bone fractures as they healed. Additionally, he introduced a new system of training surgeons during and after medical school. Halsted's radical mastectomy is one of many of his original procedures that other surgeons adopted as a standard of care.

In "Results of Operations," Halsted reviews case studies and presents his technique for radical mastectomy surgery. First, he presents results from the fifty radical mastectomies he performed at Johns Hopkins Hospital from 1889 to 1894. Next, Halsted details the previous procedures for treating breast cancer and their outcomes before explaining the reasoning behind the radical mastectomy. Then he describes the specifics of the radical mastectomy and its outcome. At the end, Halsted concludes with brief histories of each patient involved in the article's fifty operations.

In the introduction of the article, Halsted discusses the successful results of the fifty radical mastectomies that he performed between 1889 and 1894. He considers a result successful when there were no recurrences of the patient's breast cancer, which indicates that the surgery removed the entire tumor and that the same tumor did not reappear within the area operated upon, known as a local recurrence, or somewhere else in the body, which he calls a regionary recurrence. In Halsted's fifty cases, three patients had local recurrences, only one of which was inoperable. An additional eight patients suffered regionary recurrences, three of whom underwent second operations and lived, and four of whom died of either inoperable tumors or tumors somewhere else in the body. The last patient was alive at the time the article was written with an operable regionary tumor, but Halsted did not conduct the surgery because she also had an inoperable tumor in her femur. Halsted concludes with percentages pertaining to the forty-six patients whose long-term outcomes could be assessed. Seventy-three percent of the patients did not develop local or regionary recurrences. An even higher percentage, ninety-three percent, did not develop local recurrences.

Halsted then explains other surgical procedures for treating breast cancer prior to his radical mastectomy. Those procedures largely involved removing the breast tissue as well as the lymph nodes of the underarm, but not the chest muscles. Halsted claims that surgeons at the time did not

think tumors could involve the muscles of the chest. According to Halsted, those surgeons thought that any tumors found on or near muscle tissue resulted from ducts that carry white blood cells throughout the body, or lymphatic vessels, which can contain cancerous cells. However, at the time surgeons assumed that the muscles transferred fluids into the lymphatic vessels. Therefore, Halsted reports, other surgeons surmised that any tumors found near muscle tissue had infected the layer of tissue above the muscle, which had more contact with lymphatic vessels, and not the muscle itself. According to Halsted, other surgeons inferred that the thin tissue covering the chest muscles could be cancerous, but not the muscle itself. However, in his articles Halsted states that he had seen cases in which the cancer had spread to the muscles themselves. Thus, to remove the cancer entirely, Halsted argues for the removal of the larger of the two chest muscles, called the pectoralis major.

After discussing prior methods of surgically treating breast cancer, Halsted details the specific procedure of the radical mastectomy and he explains why it is more effective than other procedures. The procedure removes the breast tissue, the pectoralis major chest muscle, and the lymphatic vessels from the chest to the upper arm. Halsted claims that by removing the pectoralis major, the surgeon can easily remove all tissue that could contain cancerous tumors in one piece. Halsted states that removing tumors in piecemeal could leave pieces of cancerous tissue behind. Halsted then details precise surgical instructions of how to remove the pectoralis major.

The main focus of Halsted's radical mastectomy is the removal of the pectoralis major chest muscle and the breast tissue. Halsted instructs the surgeon to make a continuous incision around the breast. Then, he describes the incisions the surgeon makes to separate the pectoralis major chest muscle from the tissue beneath it. Once that is done, Halsted instructs the surgeon to remove the pectoralis major and the tissue resting on top of it, including the breast tissue. Halsted's remaining instructions describe how to remove the lymph nodes and clean the lymphatic vessels by scraping all flesh away from them with a knife. All other instructions describe how to close the wound safely.

After Halsted describes the surgical process, he discusses the outcomes of the procedure. Halsted states that of the seventy-six operations he performed in all, even counting the twenty-six incomplete operations that are not part of the official fifty results, no patient died due to the operation. However, patients did experience some minor disabilities due to how much tissue was removed during surgery. Because the surgeons removed pieces of skin near the underarm, some patients were not able to dress their hair, as lifting their arms above parallel was difficult. But, Halsted reports, because loss of muscle did not cause that problem, he relieved the patients' disabilities through skin-grafting procedures that restored skin to the underarm areas. Additionally, some swelling accompanied the healing process after the procedure, but once that reduced, the patients retained function of their arms. Halsted ensured patients had that functionality by securing a certain flap of skin in a particular manner during the procedure so that the arm did not end up fused to the patient's side. However, Halsted claims that even minor disabilities caused by a radical mastectomy are trivial because no disability is worse than dying. He further defends the results of his procedure by reasoning that because most of the patients are older, averaging fifty-five years of age, they are no longer very active members of society and so slight disabilities do not matter.

Halsted concludes his "Results of Operations" by stating that the radical mastectomy, if performed early on, makes breast cancer a curable disease. However, he suggests that surgeons practice the procedure on cadavers before performing it on patients and warns that it is not an operation that surgeons can properly perform after two or three trials. He did not specify how much practice he recommended. After his concluding statements, Halsted provides brief histories of all fifty cases he operated on between 1889 and 1894 that he included in the results section. The histories include the patients' initials, age, marital status, kind and placement of tumor, type of surgery used to remove the tumor, symptoms of the tumor, the initial prognosis immediately after the surgery, and an update on the patient's condition usually a year after the surgery. Following the histories, Halsted also provides four illustrative plates, including two anatomical diagrams showing skin incisions and muscle placements, as well as two photographs, one of an area operated upon just before Halsted removed the tumor and one of a tumor after Halsted removed it.

As late as 1970, surgeons considered Halsted's radical mastectomy, first outlined in "Results of Operation," as the conventional surgical treatment for breast cancer. Bernard Fisher, a professor of

surgery at University of Pittsburgh School of Medicine in Pittsburgh, Pennsylvania, who conducted extensive research on breast cancer, noted that by 1970 surgeons debated whether the radical mastectomy remained the best treatment option. Fisher argued that it was irrational to continue to endorse the radical mastectomy without considering the fact that surgery had progressed and new treatment options exceeded the radical mastectomy in treating breast cancer. Such procedures included mastectomies that removed less tissue, as well as lumpectomies that removed only the tumor from the breast, leaving the body's normal tissue intact. Additionally, Fisher noted that those procedures, when used in the appropriate cases, produced the same successful results as the radical mastectomy without the physical deformities or disabilities.

Sources

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