History of Breast Surgery

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1.1 Introduction

The historical evolution of breast cancer surgery started with ancient civilizations using some minor surgical techniques and cauterization. In other words, breast cancer treatment initiated with surgery and maintained its therapeutic potential until now. Breast cancer surgery has gone through four periods since ancient times.

1.2 First Period: From Hippocrates to Saint Agatha

It seems that the recognition of breast cancer as a disease begins in the depths of antiquity. There reference in Egyptian papyri (Fig. 1.1) of the second BC Millennium-findings by Edwin Smith and the Ebers to breast tumors.

Indeed, the Edwin Smith papyrus gave clear guidance for the diagnosis and treatment of ulcerated breast tumors in man.

This period seems to know the concept of mastectomy. The Amazons cut their right breast with a glow instrument to better handle the javelin. There name originates from (a (privative) + mazos (breast). From the same period, there are other descriptions for mastectomy, but all of them have the character of punishment of women for various reasons.

In fortieth century BC, the contribution of Hippocrates (Fig. 1.2) in the diagnosis and treatment of many diseases, including breast cancer, was fundamental [1]. Hippocrates proposed surgical treatment in cases of ulcerated or inflammatory breast tumors and cauterization of the limits of the lesion. The successor of Hippocrates, Galen (twentieth century AD), raised clearer (for its time) indications for surgery and described some surgical techniques.

In seventieth century AD, Paul of Aegina described the first breast cancer surgery done

Fig. 1.1 The Edwin Smith papyrus describing breast cancer patients

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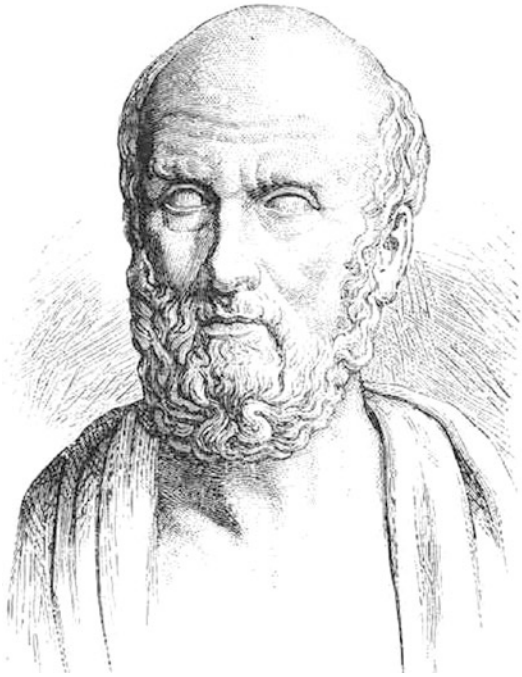

Fig. 1.2 Hippocrates (450–380 BC)

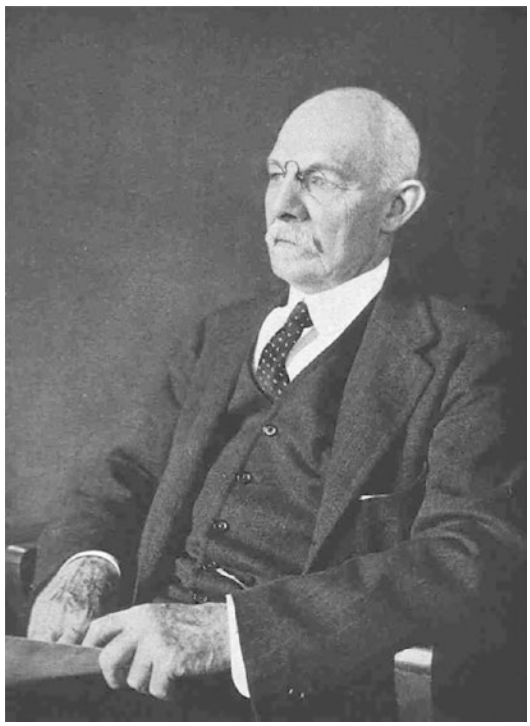

Fig. 1.3 William Steward Halsted

without excision of the breast. After a small incision, was trying tumor ablation with a glow tool. The results of course were poor, as were generally poor results of efforts made during the Medieval and Renaissance times. At the same time, they did not stop running mastectomies as a punishment for women of the time. Feature martyrdom of Saint Agatha, which was punished with mastectomy refusing marriage proposal from a Roman because she was Christian [2].

1.3 Second Period: Nineteenth to Twentieth Century

The real breakthrough in breast surgery and general course in surgery was performed in the nineteenth and of course the twentieth century. Gifted surgeons and researchers of their time (Robert Liston, Astley Cooper, Richard von Volkmann, James Paget, Theodor Billroth, etc.) laid the foundations for the diagnosis and treatment of breast cancer with methods and techniques medically and humanely acceptable [3].

Joseph Lister (1827–1912) made a radical change in the surgical insertion of antisepsis in all operations. Thereafter followed a strong decrease in mortality rates after mastectomy since the contamination of wounds and sepsis which where a major cause of early postoperative death. Joseph Pancoast (1805–1882), an ardent supporter of ultraradical surgery, described a mastectomy technique that included removal of all mammary glands, the axillary lymph nodes, and chest muscles. He considered it a systemic disease and believed that only surgical treatment is not sufficient [4].

1.4 Third Period: William Stewart Halsted

The surgeon that indelibly marked the nineteenth century was definitely William Stewart Halsted (1852–1922) (Fig. 1.3). Halsted combined the Lister antisepsis using sterile surgical gloves achieving excellent results for its time. He described a technique in which the tumor is removed along with the breast in major and minor pectoralis mus-

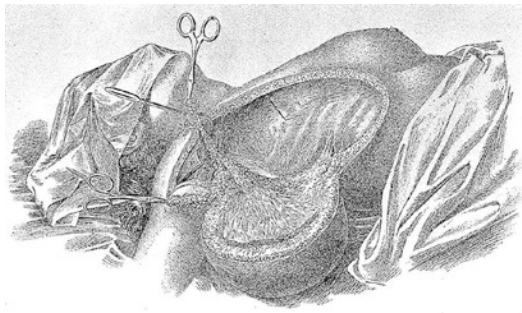

Fig. 1.4 Radical mastectomy reported by William S. Halsted in 1894

cles and the axillary lymph nodes in a preparation. This technique is named Halsted mastectomy after Halsted and was the surgery of choice for breast cancer until 1950 in Europe and until 1983 in the USA. It has been mentioned that the 5-year survival rate after Halsted mastectomy was 42% [5].

The "Halsted theory" stated that breast cancer initially spread from the breast only locally by first invading contiguous tissue and then spreading though lymph ducts to regional lymph nodes, where the cells were "trapped" for some time before hematogenous spread of tumor cells to distant sides.

Based on this hypothesis, it was believed that the more extensive and thorough the resection, the better the expected results.

Based on the same principles, more radical procedures were also described including the "extended radical mastectomy" and operations involving the removal of more regional lymph nodes such as the supraclavicular, the internal mammary, and even the mediastinal lymph nodes. These procedures were abandoned due to poor results and increased morbidity and mortality [6].

The Halsted mastectomy (Fig. 1.4), because of radicalness, is not devoid of postoperative complications such as large traumatic surfaces, lymphedema, and malformations.

David Patey (1899–1977) modified the Halsted technique keeping the pectoral muscles, unless they were infected, and performing smaller incision mastectomy. He noted that the amendment did not alter the local recurrence and survival rates. Mastectomy by Patey is even today the surgery of choice, when of course it cannot be conservative surgery [7, 8].

Progress achieved in the diagnosis and treatment of breast cancer these days has now led to the survival of patients in number of years that the aforementioned great surgeons of the past would have found difficult to believe. Newer methods of chemotherapy and radiotherapy on the one hand have improved quality and quantity of life of women with breast cancer and on the other hand have given surgeons the ability to perform more conservative surgery in the breast. It seems that conservative breast surgery is currently the "gold standard" surgical treatment, combining excellent oncological results without the problems of large traumatic surfaces [9, 10].

1.5 Fourth Period: Umberto Veronesi

The evolution of surgery in breast cancer at the turn of the century can no longer start from the mastectomy but should, in my opinion, start from conservative surgery. Halsted and Patey's techniques were milestones in breast surgery. In 1969, U. Veronesi (Figs. 1.5 and 1.6) proposed a

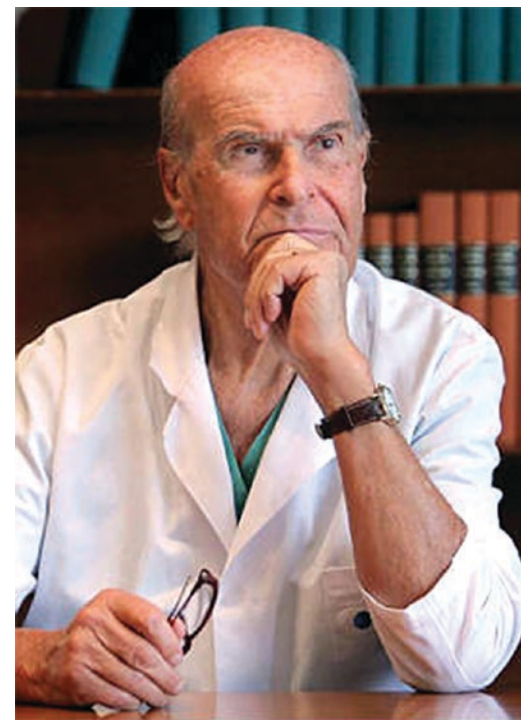

Fig. 1.5 Umberto Veronesi (1925–2016)

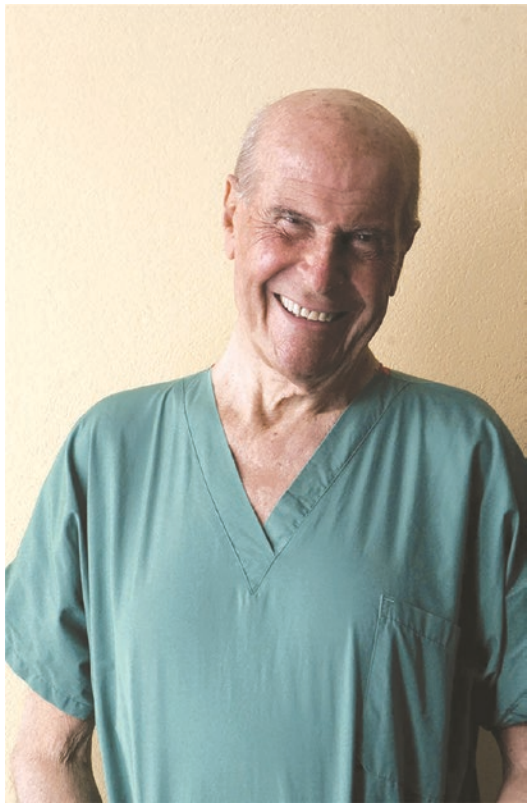

Fig. 1.6 Umberto Veronesi

randomized trial comparing the Halsted mastectomy with the conservative resection of the tumor and radiotherapy, which he later presented in London. This is the first major development in the recent history of breast surgery [11].

One should and must in any great moment of surgery take into consideration the time in which one will present the news, the methodology of the patient group, and the organ to which it will apply.

1. The application of conservative surgery.
2. The major evolution of the removal of axillary lymph nodes with the reduction method of sentinel lymph node, a technique that every day is gaining ground in our country.
3. The reduction in external radiation therapy that only the future but also the lack of local recurrences will prove its usefulness.

Three major developments took place since then:

The new concept that dominates all cancer hospitals in the world over the past 20 years is to go from the *maximum* to the *minimum acceptable* treatment.

So can you see the evolution in time to split into 3 phases 1968–1985 decreased the surgical piece in the breast, decreased from 1986 to 2000 every day and in most hospitals the removal of axillary lymph nodes and in 2000 experimentally in randomized trials to reduce the external Radiotherapy.

Phase one (1) aimed at better control of the local disease, the best aesthetic effect, and best possible quality of life.

If I must insist on something after 20 years of personal experience in a small conservative surgery for breast cancer are tumor size and its relation to the size of the breast. A tumor 2 cm in size in a small breast is a large volume, while a tumor 3 cm in size in a large breast may be small. The cosmetic result of surgery which was and remains the primary objective depends on the flawless technique of surgery that has dominant element incisions of the skin and good reconstruction of the mammary gland [12].

The quality of life of women with breast cancer undoubtedly changed after application of conservative surgery.

So if one takes into consideration that all studies showed local recurrences did not affect overall survival, then we are led into a first conclusion that conservative surgical breast followed by external radiotherapy can safely replace mastectomy. 250,000 women in 20 years in two large studies of Milan and the NSABP proved it.

In phase two (2) reducing underarm debridement is a large second development.

Knowing the status of axillary lymph nodes is of great importance for planning further therapeutic maneuvers. It turns every day that cleaning underarm does not promote prognosis but is very important for staging. Also, healthy lymph node removal is an operation that can only create problems. Those who put in their daily surgical practice the sentinel lymph node are satisfied that it provides sufficient information on the condition of axillary lymph nodes [13].

1.6 New Era of Mastectomy

In conclusion, even today, mastectomy is still necessary for a high percentage of breast cancer patients. Radical mastectomy is rarely used nowadays. The main indications for mastectomy include extensive or multicentric disease, contraindication, failure or recurrence after BCS, locally advanced and inflammatory cancer, and risk reduction if the patient so chooses [14]. Skin-sparing mastectomy is a safe option, offering better cosmetic results for patients who have an indication for mastectomy and immediate reconstruction provided that the skin is not involved and there is no inflammatory cancer [15]. Nipple-sparing mastectomy can be applied safely in carefully selected patients and can provide improved cosmetic results. Risk-reducing mastectomy should be performed when indicated in a way that provides the best quality of life for the patients [16–18].

1.7 Tips and Tricks

- Breast cancer is an ancient disease.
- Galen described cancer as a crab and first preferred to excise a lesion.
- Halsted described radical mastectomy as a choice of surgery. It is preferred until the second half of the twentieth century.
- Patey reported modified radical mastectomy instead of radical mastectomy which had many complication and morbidities.
- Following Veronesi's proposal of breast-conserving surgery, surgery changed from the maximum to the minimum acceptable treatment.
- Nowadays, breast-conserving surgery and mastectomy with better cosmetic target is still performed by using oncoplastic and reconstructive techniques.

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