

THE TREATMENT OF BREAST CANCER IN ANCIENT ROME: 27 BCE-476 CE

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ABSTRACT

Thesis Statement: Roman physicians and surgeons established general protocols for the diagnosis and treatment of breast cancer. still followed by oncologists today. **Methodology:** Historiography and conceptual analyses of the writings of ancient and modern physicians and conceptual analysis. **Results:** Ancient and modern physicians used a similar protocol to diagnose breast cancer. This protocol included: 1) subjective information from the patients, 2) the objective findings of physicians, 3) assessment of these findings and their correlation with other patients with similar subjective and objective data, 4) formulating a treatment plan. They also used a similar protocol for treatment of breast cancer. This protocol included: 1) Mitigation, 2) Treatment of symptoms, and 3) Experimentation with known therapies. **Conclusion:** Roman and modern physicians treated breast cancer with similar protocols. Although the protocols are similar, modern oncologists have diagnostic and treatment options, techniques, and equipment unknown to the Romans.

KEYWORDS: Breast Cancer, Oncologist, Protocols, Diagnosis, Treatment.

INTRODUCTION

The thesis of this paper is Roman physicians and surgeons established general protocols for the diagnosis and treatment of breast cancer. still followed by modern physicians and surgeons. The protocol for diagnosis included (1) subjective information from the patients, (2) the objective findings of physicians, (3) assessment of these findings and their correlation with other patients with similar subjective and objective data, (4) formulation of a treatment plan, and (5) alteration of the treatment plan based on its results. The protocol for treatment included (1) nonoperative procedures, (2) surgical procedures, (3) convalescence, and (4) physical therapy. Although the protocols are similar, modern oncologists have diagnostic and treatment equipment unknown to the Romans.

Breast cancer is a malignant neoplasm of the breast. It is much more common in women than men. 12.35 percent of women will develop breast cancer in their lifetime. Ancient, Roman women were no exception. About 90% of the cases of breast masses are discovered by breast self-examination. The remainder are detected during a physical examination, including a finger probe, by a physician or another health care professional.^[1] In an era without microscopic tissue examinations, mammography, Magnetic Resonance Imaging, ultrasound, computed tomography, tomosynthesis. Oncologists also employ breast tissue sampling, fine needle aspiration and core needle biopsy and excisional biopsy. Roman physicians (Medici) depended on clinical

breast examination, including probing breast lumps and symptoms to detect breast cancer. The Medici could not distinguish between benign and malignant tumors during their primary phases. Roman physicians distinguished among three stages of the disease. The first stage was Karkinoi genomenoi (benign or precancerous tumors, Cacoethes (early-stage cancer) and carcinoma (more advanced cancer).^[2]

This study uses the medical techniques of Rome because the Romans incorporated knowledge from the greatest centers of medical learning in Egypt and Greece into their medical practice. Egypt became a province of the Roman Empire in 30 BC, and Greece became a province of the Roman republic in 146 BC. The Romans used and expanded upon the knowledge of medicine learned from these people.

ETIOLOGY

The etiology of breast cancer is attributed to a complex interaction between various modifiable and non-modifiable factors. These factors include genetics, environmental, nutritional, hormonal, and inheritable elements that contribute to the development of this disease. Breast cancer occurs when breast cells mutate and become cancerous cells that multiply and form tumors. These gene mutations may be inherited, develop over time as woman age and their genes enervate or develop if she exposes herself to something that damages her genes, such as cigarette smoke, alcohol or ultraviolet (UV) radiation from the sun. Nonmodifiable risk factors

include advancing age, female gender, family history, and genetics. (e.g., BRCA1 and BRCA2 genes). Modifiable factors include smoking, drinking alcoholic beverages, obesity, radiation exposure, and hormone replacement therapy.^[3] The Romans did not have access to tobacco products or hormone replacement therapy, but they did consume wines and bask in the sun on one of many Roman resorts.

DIAGNOSIS

Roman Medici did not have the equipment to distinguish among the various classifications of carcinoma. Examples are ductal carcinoma in situ, lobular carcinoma in situ, infiltrating or invasive ductal carcinoma, infiltrating lobular carcinoma, inflammatory breast cancer, Paget's disease, and Triple-negative breast cancer. The Roman strategy was watchful waiting to observe growth, color, and changes in the tumor. Medici did recognize the ability of tumors to infiltrate neighboring tissue.^[4] Hippocrates (5th-4th centuries BCE) learned that fibrous dysplasia known to be pre-malignant, Galen verified a congenital developmental breast abnormality localized to the nipple area, (polythelia) which had a good prognosis.^[5] The Medici paid careful attention to statements made by their patients, during a question-and-answer session, prior to examination.

Roman physicians knew that most lumps in the breast feel different than a cancerous breast lump does. Benign lumps usually feel smooth, soft and move from side to side. With cancer, a breast lump typically feels hard and is immobile when you push on it. The lump is sometimes irregularly shaped. A complete breast examination involved inspecting and palpating the breasts with the patient in the sitting and supine positions. The medici also examined the nipples for retraction and skin irritation. However, there are several benign breast disorders to be considered. Examples are physiologic swelling and tenderness, nodularity, breast pain not associated with malignancy, nipple discharge and breast infection and inflammation.^[6]

TREATMENT

Oncology is the branch of medicine dealing with tumors. It did not become a designated subspecialty of internal medicine until 1972. However, Roman physicians did specialize in certain areas based on personal interests. For example, most female Roman physicians focused on gynecology, obstetrics, and pediatrics.^[7] Roman physicians who concentrated on oncology were older, experienced physicians. In the 2nd century CE, the Greek physician Galen used oncos (swelling) to describe tumors. He also used -oma to indicate cancerous lesions. The modern word oncology stems from Galen's lexicon. Modern oncologists use a multidisciplinary approach in the treatment of breast cancer. Treatments can include surgery, chemotherapy, radiation therapy, immunotherapy, hormone therapy, medical therapy,

hormonal therapy, HER2 Directed Therapy and targeted therapy.^[8]

Roman medici employed surgery, cautery, caustics, plant, and animal products to treat breast cancer. The Medici recognized the cancer surgery of the breast caused serious hemorrhage. Therefore, they combined surgery with cauterization to reduce bleeding. This painful procedure was limited to otherwise healthy women and required general anesthesia. On the day of the surgery, the patient lied on her back on the surgical table. A nurse (nutrix) thoroughly cleansed the affected breast and applied acetum (vinegar) around the operation site of the breast.

Roman Medici employed the Dissociative (sedation, twilight) method of anesthesia. The patient drank a sedative and analgesic in wine to experience marked analgesia. The analgesic of choice was powdered opium (Papaver somniferum). The Romans imported opium from the East via the Silk Road and might not be available. In that case the medicus administered mandrake (Mandragora officinarum) instead. The sedative of choice was Valerian (Valeriana Officinalis). The medici determined the depth of anesthesia from the presence or absence of responses to painful stimuli, changes in the pattern and depth of respiration, changes in muscle tone, and changes in the heart and pulse rate. Roman surgeons (medici chirurgi) also had the use of a local anesthetic Henbane seeds (Hyoscyamus niger) which could be applied to a painful area in powdered form.

Surgeons had a variety of instruments to operate on breasts. Examples are the corvus (scalpel), volsella (tweezers), ferrum candens (cauteries), clamps, probes, curettes and several other instruments. An assistant (capsarius) boiled in water all surgical instruments, lint, fibulae, bandages, etc. prior to use before every operation. The Medici preferred rainwater for all medical procedures and pharmaceutical products. Buildings had an opening in the roof (compluvium) which allowed rainwater to enter and collect in a scrupulously clean pool (impluvium). Capsarii stored the water in amphorae.^[9] Roman surgeons performed two kinds of surgery-lumpectomy, in which the tumor and no other tissue or lymph nodes are removed, and, rarely, mastectomy, a surgical operation to remove a breast. Physicians knew the size of the breast carcinoma is the single best predictor of the likelihood of positive axillary nodes. If the tumor was less than five centimeters across, they would perform a lumpectomy. If the tumor was large, and the Medici believed the patient had advanced breast cancer, a mastectomy could be performed with the consent of the patient.^[10]

The surgeon worked as quickly as possible. With the anesthetized patient lying on her back, an incision was made with a scalpel through healthy tissue surrounding the cancer, and the cut surface immediately cauterized

with a hot ferrum candens to prevent hemorrhaging. The surgeon repeated this procedure until the resection of the tumor. Finally, the medicus cauterized the whole cut surface.^[11] Galen wrote “cut off the whole affected part so as to leave no root behind.”^[12] During mastectomies Medici used arterial clamps, ligatures, and cauterization to control bleeding. After surgery the medicus sutured the wound with silk, linen or gut thread and closed the margins of the wound, held in place with fibulae (steel safety pins), and fixed by a thread twisted around the in the figure “8.”^[13] The medicus cleansed the surgical area with acetum and applied a poultice containing henbane, plantain leaf, yarrow, honey, lint, and aloe vera in a wool fat ointment stiffened with beeswax. He then bandaged the poultice to the site of the wound.^[14]

Women too frail to undergo surgery received treatment with mild caustics such as copper scales and herbal medicines. Caustic agents are topical hemostats that are applied to the tumor and coagulate tissue by promoting protein precipitation and vessel occlusion. Caustics can destroy cancerous tissue by chemical action.^[15] Roman physicians used three natural products to combat cancer: sea squirts, and the herbs Plantain Weed (*Plantago major*) and White Birch (*Betula alba*) (*Betulaceae*). Sea squirts (*Aplidium albicans*) were found off the Mediterranean coast. The organism contains Aplidine which blocks the cell division cycle in human cell lines and prevents the onset of DNA synthesis. The leaves of Plantain Weed contains flavonoids that are anti-inflammatory, astringent and styptic. The outer bark of White Birch (*Betula alba*) contains betulin and betulinic acid which inhibits tumor growth in cancer cells. Medici ground these products to tiny pieces and administered them as a suspension in mulsum (a mixture of honey and wine).^[16] All patients with breast cancer received this suspension before and after surgery or caustics for a period. Finally, physicians encouraged patients to eat foods, which they knew from years of study, tended to prevent breast cancer. Examples are apples, legumes, turmeric, grapes, and dairy products.^[17] Patients with advanced metastatic cancer were made comfortable with analgesics, sedatives, and symptomatic treatment.^[18]

CONVALESCENCE

The medicus counseled the patient and her family about the cancer, its progression, treatment, and expected outcome. He recommended taking the prescribed medicines exactly as directed. He also encouraged patients to eat foods which tended to prevent cancer along with nutritious, soft foods, and drink fluids, such as water and juices. The medicus stressed the importance of adequate sleep and rest. The physician asked the patient to return periodically for a complete breast examination for five years. The patient required encouragement and the medicus addressed the patient's fears, particularly as they related to changes in body image, pain and dying. He referred severely depressed women to a medicus who specialized in psychiatric disorders.^[19] The medicus recommended that the patient

exercise when possible and increase the intensity of the exercise as time passes. They began gently. The women raised their arm on the same side as the surgery and opened and closed their hands frequently, then they bent and straightened their elbow several times. Advanced exercises included walking, range and motion, swimming, jogging and, eventually gymnastics. If the patient experienced constipation because of using opium to relieve pain, linseeds *Linum usitatissimum*) provided relief.^[20] For fevers the Medici used a powder made from the bark of the Willow Tree (*Salix*). Women were told to contact their physician if their symptoms worsened, or if they had new symptoms, like pain or weakness in a different part of their bodies, for possible changes in treatment.^[21]

CONCLUSION

This article demonstrates that Roman physicians and surgeons established protocols for the diagnosis and treatment of breast cancer, still followed by modern physicians and surgeons. The protocol for diagnosis included (1) subjective information from the patients, (2) the objective findings of physicians, (3) assessment of these findings and their correlation with other patients with similar subjective and objective data, (4) formulation of a treatment plan, and (5) alteration of the treatment plan based on its results. The protocol for treatment included (1) nonoperative procedures, (2) surgical procedures, (3) convalescence, and (4) physical therapy. Although the protocols are similar, modern oncologists have diagnostic and treatment equipment unknown to the Romans.

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