

History

An early history of human breast cancer: West meets East

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Abstract

Cancer has been increasingly recognized as a global issue. This is especially true in countries like China, where cancer incidence has increased likely because of changes in environment and lifestyle. However, cancer is not a modern disease; early cases have been recorded in ancient medical books in the West and in China. Here, we provide a brief history of cancer, focusing on cancer of the breast, and review the etymology of *ai*, the Chinese character for *cancer*. Notable findings from both Western and Chinese traditional medicine are presented to give an overview of the most important, early contributors to our evolving understanding of human breast cancer. We also discuss the earliest historical documents to record patients with breast cancer.

Key words Breast cancer, history

Early Reports of Breast Cancer in the West

Early medical writings from the ancient Greeks and Egyptians described diseases that are likely to have been cancers. Hippocrates (460 – 377 BC), considered the “father of medicine,” was a Greek physician and teacher of medicine whose name today is associated with the high ethical standard of Western medicine. Hippocrates is said to be the author of a large volume of Greek medical literature. He and his contemporaries described many types of diseases, which were probably cancers of the stomach, rectum, breast, uterus, skin, and other anatomic sites.

The influence of Hippocrates can be understood through a simple example. Some arguments he used have become maxims; for instance, “He will manage to cure best who has foreseen what is to happen from the present state of matters.” This is the maxim cited by Rosen in the preface to his book *Breast Pathology*^[1]. Doctors of Western medicine up to the present day have accepted many other sayings of Hippocrates as standards.

Perhaps the first reported instance of a human breast tumor was that recorded by the Greek historian Herodotus (485–430 BC), generally called the “father of history.” The term *tumour* (the Commonwealth spelling), or *tumor* (the American English spelling), is derived from the Latub word for *swelling*. Herodotus’ work is the

oldest surviving major piece of Greek prose, and he was the first known historian in Western civilization. To Herodotus, two ways of life were opposed in the great wars between the Greeks and the Persians (499–479 BC). He wrote about the freedom of the Greeks and the despotism of the Persians. Nevertheless, he was so fair to the Persians that he was called, in later ages, “friend of the barbarians.” In the book *Pathology of Tumours*, Willis noted, “Hippocrates and his contemporaries knew of cancer of the breast; but earlier still and perhaps the first specifically reported instance of breast tumour; was that recorded by Herodotus.”^[2] Herodotus wrote about Atossa, daughter of Cyrus (Persian king, 600–530 BC) and the wife of Darius I (Persian king, 550–486 BC), stating she “had a tumour on her breast after some time it burst; and spread considerably. As long as it was small she concealed it, and from delicacy informed no one of it; when it became dangerous, she sent for Democedes—a famous doctor of medicine—and showed it to him.”^[2] Willis comments that, “Democedes is said to have cured it, but by what means or how permanently we are not told; and of course, as with all early records, we cannot be sure of the nature of the lesion.”^[2]

Early in the first century AD, the writings of Aulus Cornelius Celsus (25 BC–AD 50) included not only the most complete Roman medical text of its time but also a history of early medicine. Although he was the author of a comprehensive work, only the section on medicine has survived. This section is named *De Medicina*; Spencer translated it in *Celsus: De Medicina*^[3].

De Medicina included writings on nutrition, pharmacology, surgery, and mental diseases. It drew largely from earlier Greek medical writers and is the source for what we know today about the medical and surgical practices of the Hellenistic period. The Hellenistic Age extended from the death of Alexander the Great, Macedonia’s king, in 323 BC to the beginning of the Roman Empire

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doi: 10.5732/cjc.013.10097

in 30 BC. The name *Hellenistic*, as distinguished from *Hellenic* or *Greek*, refers to the civilization that developed from the interaction between the Greek culture of the Macedonians and the non-Greek societies of the Old Persian Empire.

Spencer noted that “the preface of the *De Medicina* was especially note-worthy as the earliest history of ancient medicine. Celsus avoided dogmatic conclusions and steered a middle course between conflicting medical ideas. He often accepted the opinions of Hippocrates. Celsus practiced the operation of the breast for early cancers, but he considered that the operation on advanced cases could aggravate the disease.”

Paul of Aegna (AD 625–690), a Greek physician and writer, wrote about breast cancer in his medical encyclopedia *Epitome Medicae (On Medicine)*. Willis cites: “Cancer ... is particularly frequent in breast of women ... For cancer are formed by black bile over-heated; and if particularly acrid, it is attended with ulceration. ... The veins are filled and stretched around like the feet of the animal called cancer (crab), and hence the disease has its appellation. But some say it is so-called because it adheres to any part which it seizes upon in an obstinate manner like a crab.”^[2]

A History of Breast Cancer in China^[4]

The earliest Chinese medical writings about breast cancer appeared in *Urgent Therapeutic Prescription for Axilla Diseases* (肘后备急方), which was published in 375. This medical book was written by famous Chinese Taoist and doctor Hong Ge (葛洪, 281–341) during the East Jin dynasty (东晋, 317–420). In volume five of this book, he described breast cancer as “a lump, hard as a stone, with a form resembling a nucleon of drupe or a walnut. During the first stage of the disease, the color of the breast skin did not change in comparison with normal breast tissues. Then the lump became bigger and bigger, it seemed as if the lump was fixed by roots.” He called this *shi* (石, stone) *yon* (疔, carbuncle), namely a carbuncle with the hardness of stone. The carbuncle-stone with its roots became an infiltrated lump fixed on the tissue, so it became less movable.

In the Tang dynasty (唐朝, 618 – 907), Si-Miao Sun (孙思邈, 581 – 682) was a celebrated medical expert who wrote *Essential Prescriptions Worth a Thousand Pieces of Gold* (备急千金药方), and *Additions to the Prescriptions Worth a Thousand Pieces of Gold* (备急千金药方付录), each with 30 volumes. At the time of publication, they were the largest medical works. His medical experience and results were collected during 80 years of practice.

For example, he discovered “the breast eczema found on a woman’s nipple. It was terrible painful and itching, and if the patient scratched it, then a terribly sinking yellow liquid came out. The more liquid there was the smaller the chances of healing the illness; even a hundred good prescriptions had no therapeutic effects. This eczema started after the woman began to have her menstrual cycle.” Doctor Sun called this type of breast eczema *du* (妒, fearful) *ru* (乳, breast).

Doctors of Chinese medicine have used more than nine names to label breast cancer. Until the Song dynasty (宋朝, 960 – 1279), breast cancer was referred to as *ru yan*, meaning rock (岩, *yan*)-breast (乳, *ru*). Doctor Shi-Gong Chen (陈实功, 1190 – 1270) first suggested this name in his work *The Best Gynecological Prescriptions* (外科正宗), which comprised 24 volumes and was published in 1237. The Chinese character *yan* was composed from the combination of two other Chinese characters: mountain and stone. The stone in the mountain became another character called rock. Most doctors accepted *shi ru* (石乳, stone-breast) or *ru yan* (乳岩, breast rock) in their different forms but believed them to have nearly the same meaning. Hence, these characters were used to describe breast cancer for over 1,000 years before the word cancer was used.

However, the definition of *ru yan* did not make a clear distinction between cancer and carbuncle, lump, or furuncle. Because of this, Dong Xuan (东轩居士), a lay Buddhist active in the 12th century, proposed the use of a new Chinese character, *ai*, for describing cancer. This character was composed of two other Chinese characters—*three mouths* (品) over the *mountain* (山)—taken together. This idea can be found in his book *Treasure of Prescriptions for Preventive and Therapeutic Diseases* (卫济宝书), which was published in 1170. In this book, he clearly stated that cancer, *ai*, “was completely different from carbuncle, lump, or furuncle.” However, at the time, his proposition was accepted neither by his contemporaries nor in later periods by other Chinese doctors of medicine, who preferred the use of the term rock-breast (*ru yan*) to describe breast cancer.

Several centuries passed before *ai* eventually became the Chinese character for cancer; and this character is still used today. We do not know exactly when and by whom this word was introduced. It seems that the proposition of the lay Buddhist Dong Xuan was rediscovered and accepted by Eastern scholars after the 18th century. This may have come from the translation of the English word cancer (Table 1). A Japanese-English dictionary published between 1857 and 1862 officially defined cancer by using the

Table 1. Evolution of names for breast cancer in Chinese, with English translations

Chinese name	English translation	Introducer/First user
石疔 (<i>shi yon</i>)	Stone carbuncle	葛洪 (Hong Ge)
妒乳 (<i>du ru</i>)	Fearful breast	孙思邈 (Si-Miao Sun)
乳岩, 癌 (<i>ru yan, ai</i>)	Rock breast	陈自明 (Zi-Ming Chen)/ 东轩 (Dong Xuan)
乳癌 (<i>ru ai</i>)	Breast cancer	Unknown

Chinese character *ai* with the Chinese sign for *diseases* together. Subsequently, a Chinese-English dictionary also officially accepted *ai* (癌) as the name of cancer. However, there is also evidence that many Asian countries have used *ai* as the term for cancer since the 18th century.

Now, we understand that the Chinese character *ai* indicates that breast cancer is a very dangerous disease, perhaps referring to an active volcano with many craters — *three mouths* over the volcano—*mountain*. Moreover, there are notable differences between Western and Eastern cultures and medicines, which use two distinct descriptors for cancer—the crab and *ai*. The crab description of cancer was based on a morphologic observation, a rather objective approach to reality. However, the *ai* descriptor for cancer was established on the basis of feeling, a more subjective approach. The pronunciation of *ai*, which is similar to the word for sorrow (哀), is supposed to represent sorrowful groans and moans of either the patients or their families and friends. Hence, Dong Xuan proposed

using *ai*, though he was still overcome by fear because he did not know the nature of *ai* or how to cure it.

After the 18th century, Eastern medicine increasingly accepted cancer as a widespread disease. In Japan, Korea, and other Asian countries, as in China, doctors named the different types of cancer by using two Chinese characters: the name of an organ and cancer (*ai*). For example, *ru ai* (乳癌) is breast cancer, and *wei ai* (胃癌) is gastric cancer.

In summary, although cancer has become a top killer of humans in recent years, it is not a modern disease. Ancient descriptions of cancer are often vivid and dramatic, evoking frightful images such as a crab with fierce spreading feet or an exploding volcano. With the tools that are available to us today, it is our hope that we will finally overcome this disease that has been afflicting us for ages.

Received: 2013-05-21; revised: 2013-07-23;
accepted: 2013-07-23.

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Note from Senior Associate Editor (Wei Zhang): Dr. Yan received a Master of Science (MS) degree from Peking University, where she was a student of Professor Long-Xiang Zhang, the former President of the university. Dr. Yan was one of the few MS graduates before the Cultural Revolution. Dr. Yan has been an influential researcher of Chinese tea and developed the first instant Chinese tea in the 1980s. Following in her father's footsteps, Dr. Yan went to Belgium to study and settled there. In 2009, she published a book on breast cancer: Identification of Human Breast Cancer by NIR Spectroscopy and Radiorespirometry (IM Publications LLP, West Sussex, the United Kingdom). This article was written upon invitation from Dr. Wei Zhang, who was also Professor Longxiang Zhang's student before going to graduate school in the United States in 1986.