

A Note From History: Landmarks in History of Cancer, Part 2

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Events that took place in medicine during the 15th, 16th, and 17th centuries signaled the end of the Dark Ages. The Renaissance movement, spreading from Italy across Europe, ended the religious and public prohibitions that had prevented progress in medicine. Pioneer physicians and surgeons who gave their attention to discoveries in anatomy, physiology, and chemistry established the foundations for tumor pathology, surgical oncology, and medical oncology. This review is a summary of their accomplishments. **Cancer** 2011;117:2811–20. © 2010 American Cancer Society.

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The rejection of Galen's 1000-year-old humoral theory by 3 French physicians and surgeons, Lanfranc (1252–1315), Henri de Mondeville (1260–1320), and Guy de Chauliac (1300–1368), coincided with the first public postmortem dissection of 2 human bodies in 1315 in Bologna, Italy and came after the introduction of movable-type printing in 1450 in Germany by Johannes Guttenberg (1395–1468). These events signaled the end of the Dark Ages and the beginning of the Renaissance of the arts and sciences, including medicine. The first medical book was printed in 1478. It contained the medical writings of Celsus (25 BCE – ACE 50), a renowned Roman physician. The publication of Celsus' text¹ (Fig. 1) was followed shortly by the printing of several ancient medical classics, most of which were reviewed in a recent article.²

The first printed case report of a cancer was published in 1507 in a 54-page booklet, *De Abditis*, together with the autopsy protocols of 19 noncancerous cases³ (Fig. 2). The cases were compiled by Antonio Benivieni (1443–1502), a practicing physician and surgeon in Florence, Italy, and were published posthumously by his brother. The patient was a relative of Benivieni. He treated the patient, without any benefit, for vomiting and wasting. At limited autopsy by abdominal incision, Benivieni found thickened and nodular gastric folds and firm induration of the stomach, which had caused complete obstruction of the pylorus. The description is clearly a portrayal of gastric carcinoma with pyloric obstruction. Although Benivieni did not recognize it as carcinoma and did not explore the abdomen, his narration clearly refers to gastric carcinoma.³

Although sporadic application of chemical agents was introduced by the Egyptians and Greeks before the common era (BCE), the earliest systematic therapeutic use of chemicals was initiated in the 16th century by Paracelsus (1493–1541). Paracelsus was a physician-chemist and native of Switzerland. He traveled all over Europe and promoted his chemical remedies and dispensed samples to ailing patients to the annoyance of university professors. His opponents caught up with him in Salzburg, Austria, and beat him to death. Paracelsus was a pioneer in chemistry and chemotherapy. He introduced mercury, lead, sulfur, iron, zinc, copper, arsenic, iodine, and potassium as internal remedies. But he gave due warning in his writings that all chemicals are potentially poisons, and concentration and dose are what make them poisonous or non-poisonous. His collected papers on chemotherapy of various ailments, including cancers, were published by his followers in 1567 in a book,⁴ *De Grandibus*. In it, there is the first description of industrial cancer, cancer of the lung in miners of metal ores and in the workers who smelted the ore. Arsenic was the most common ingredient in chemical formulas.⁵ Repeated application of arsenic paste of various concentrations was highly recommended for cervical and other superficial cancers by Gabriele Fallopius (1523–1562), Italian priest-physician. However, he is best remembered for naming the vagina, clitoris, placenta, and the uterine tubes.⁶

Army surgeons who cared for wounded soldiers on battlefields were fully aware of the importance of knowing regional anatomy. Between wars, they used their connections in the inner circles of society and advocated anatomic

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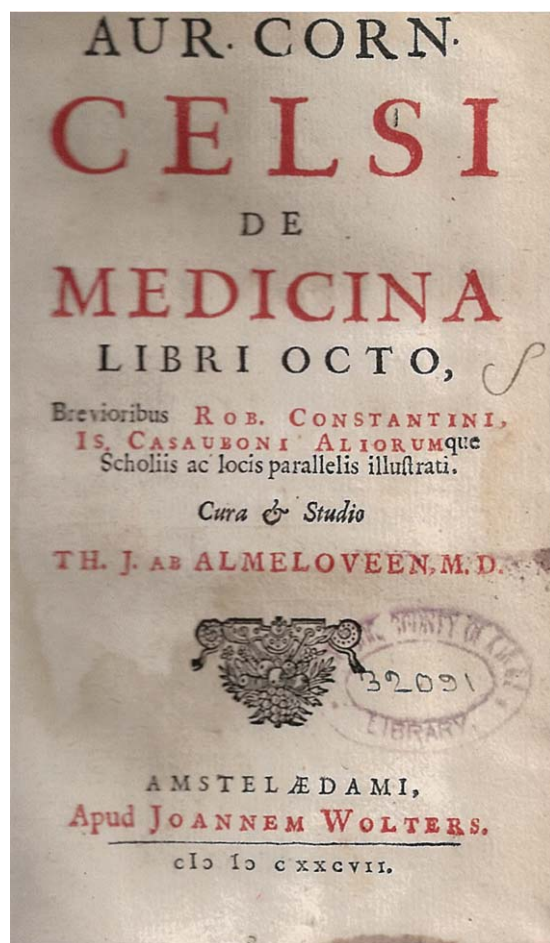


Figure 1. Celsus' *De Medicina*, published in 1478, was the first medical book ever printed. Shown is the title page of the enlarged Amsterdam edition.

dissection of the bodies of executed criminals. Conversely, physicians, who looked down on surgeons, urged post-mortem examination of patients who died of disease. French army surgeon Ambroise Pare (1510-1590) had limited interest in things other than trauma-induced wounds but was an ardent proponent of excision of superficial cancers of the lip and other sites by wide excision. He treated breast cancer by placing a sheet of lead covered with quicksilver (mercury) on the tumor, but he was against using compression of the breast, which was a highly recommended treatment by physicians in his day. Pare felt that cancers were far more common and more dangerous in women than in men. He considered cancer of the uterus and other deeply situated organs incurable and used only palliative treatment, purgatives, and diets rich in fruits and broths. His collected works, *La Method*,

ANTONII BENIVENII DE ABDITIS nonnullis ac mirandis morborū & sanationū causis liber.

HIERONYMVS BENIVENIVS
Ioanni Rosato, Medico &
Philosopho, S.



Vm post insperatam amar-
tissimi fratris mortem (qua
propterea quod quicquid
in me fugiētis uitæ ex tam
multis miserijs & languori-
bus supererat, uno illo niteretur, nihil
mihi in terris potuit accidere grauius)
eius perquam sanè honestam, & omni
doctrinarum genere locupletem biblio-
thecā euoluerem, incidi in plerāq; eius
ingenij monumenta: quæ ille, ut erat uir
doctrina & ætate prouectior, ac multarum
rerum usu & experientia pollens,
cudebat quotidie. Lectitātī igitur ea mi-
hi, ac sapius ob memoriā illius reuol-
uentī, obtulit sese interea libellus quidā,
in quo uir summo & studio & diligētia
præditus, quæcunq; trigessimū supra sea-

Figure 2. A page from Beniveni's monograph, *De Abditis*, published in 1507. It contains the first description of carcinoma of the stomach.

were published in Paris⁷ in a single volume in 1575 (Fig. 3).

A contemporary of Pare, Parisian physician Jean Fernel (1497-1558) is recognized for introducing the terms *physiology* and *pathology*. In his 1555 book, *Morbis Universalibus*, he devoted a section to cancers⁸ (Fig. 4). He felt that he was able to differentiate carcinomas and sarcomas with his naked eye because carcinomas were firm and irregular and sarcomas were soft and fleshy. But he cautioned that consistency and form of tumors may vary from organ to organ.

As postmortem examination of deceased patients became accepted as routine procedure, the search for hidden causes of diseases often produced surprises and rendered explanations for clinical signs and symptoms. An example is the autopsy case by Felix Platter (1526-1614), a Basel physician. By examining the brain of an adult male, who gradually lost his mind, an apple-sized round

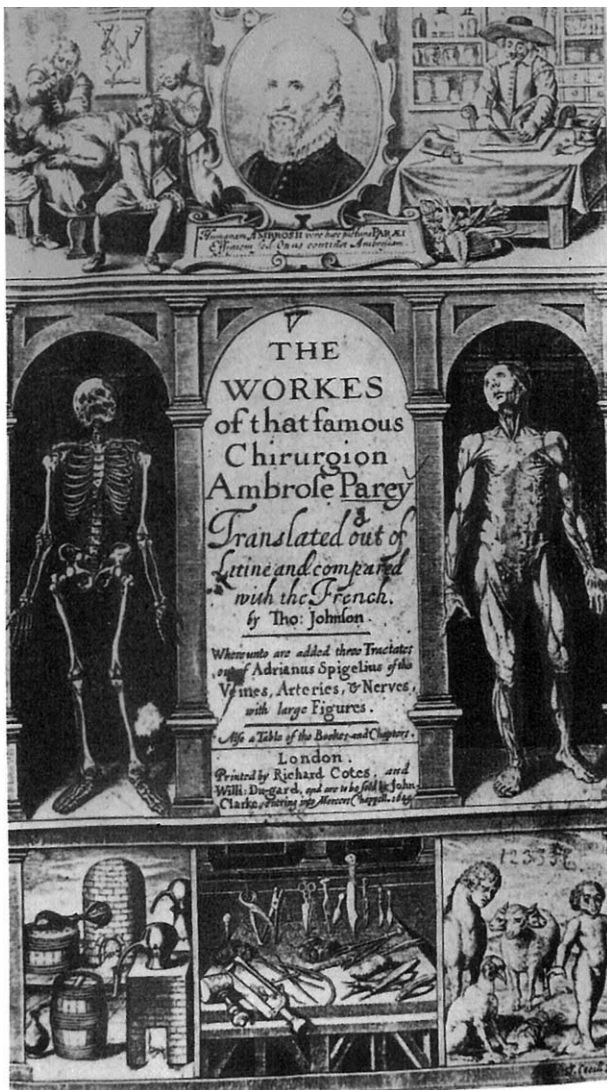


Figure 3. An English translation of Pare's collected works was published in London in 1649.

fleshy tumor was discovered in the top middle part of the brain. The tumor was encapsulated, and it compressed the substance of the brain. Clearly, the description is a portrayal of a meningioma.⁹ Platter is also recognized for describing the first case of death in infancy due to an enlarged thymus.

It is perhaps of historical interest to note that medicinal and recreational use of tobacco went on for more than 100 years in Europe before Thomas Venner of London gave warning about smoking in his *Via Recta*, published in London¹⁰ in 1620. He wrote that immoderate use of tobacco hurts the brain and the eye and induces trembling of the limbs and the heart. He concluded that the use of

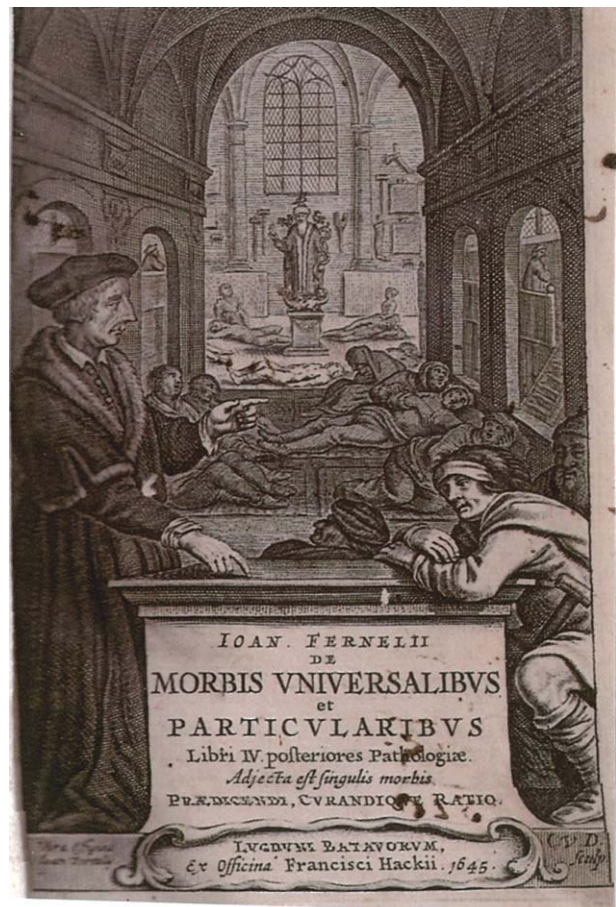


Figure 4. On the frontispiece of the 1645 edition of Fernel's *Morbis Universalibus*, Fernel is standing on the left and lecturing. He is in the traditional professional garb of his time, and his head is covered with the 4-cornered physician's cap. Notice in the title the word *Pathology*. Fernel coined the term, and it was used for the first time in print.

tobacco is tolerable as medicine for toothache, aches in the throat, and indigestion, but not as a substance for pleasure.¹¹

By the early 1600s, anatomic dissections and illustrations had been perfected to the point that very few anatomic details remained undemonstrated. As more and more operative procedures and pathologic autopsies were carried out, time arrived for correlating surgical and pathologic findings in living patients. The first surgeon who made it routine to compare surgical and pathologic findings was Marco Aurelio Severino (1580-1656) of Naples, Italy. He was a reformer in surgery and introduced many novel surgical procedures. In his 1632 book, *De Recondita*, he described and illustrated benign and malignant tumors of different organs.¹² Severino described tumors of the testis, ovary, breast, and the extremities. He wrote that

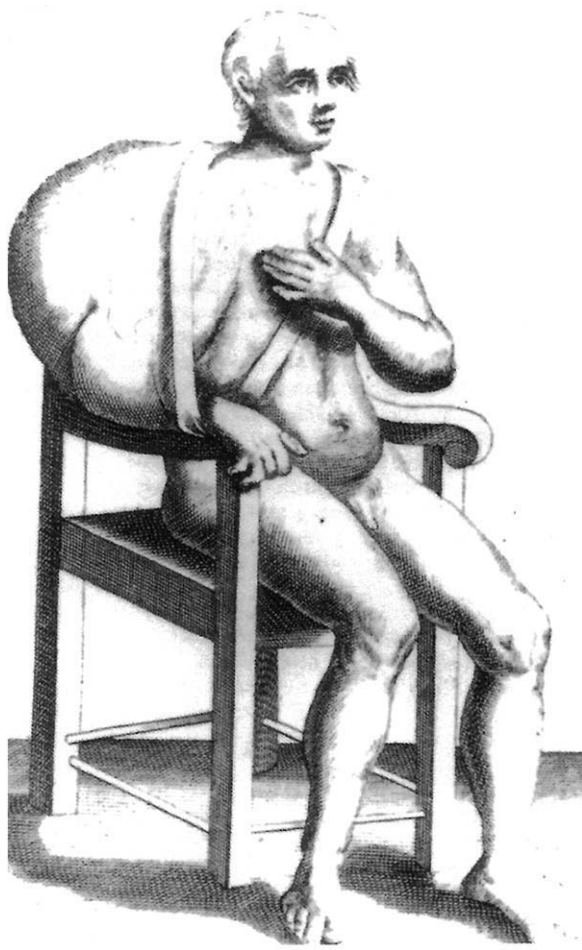


Figure 5. A large scapulohumeral tumor, most likely a sarcoma, was illustrated by Severino in his book, *De Recondita*, published in 1632. This is the first clinical illustration of a tumor.

when breast tumors were fixed to the chest wall, they were malignant, and those that were freely movable were benign glandula (fibroadenoma). He advocated surgical excision of benign tumors because of the possibility that they may become cancerous. By including 17 plates in his book, illustrating some of the largest carcinomas and sarcomas he operated on, he pioneered medical illustration of tumors (Fig. 5). Severino was aware of the potential value of microscopic examination, and in the latest edition of his book, he recommended the use of the microscope for examination of surgical specimens. Another astute surgeon, Peter Lowe (1552-1612), a Scotsman, observed by operating on tumors that cancers extended far beyond the anatomical edge of the tumor, and he became a fervent proponent of wide excision of all tumors.¹³

Two physicians in Holland, Zacutus Lusitani (1575-1642) and Nicholas Tulp (1593-1674) concluded

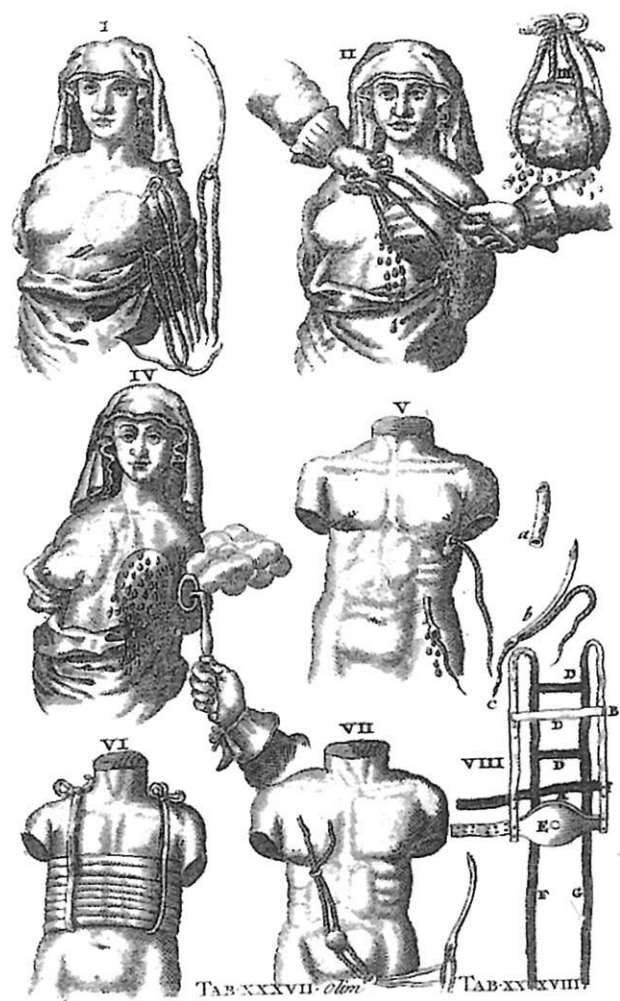


Figure 6. An illustration of the technique of mastectomy and postoperative care by Scultetus appeared in the 1655 edition of his text, *Armamentarium Chirurgicum*.

almost simultaneously that cancers were contagious. They arrived at their shared conclusion by seeing breast cancer in members of the same household. Lusitani and Tulp publicized the contagion theory in their monographs, which were published independently^{14,15} in 1649 and 1652, respectively. As to prevention of cancer, they proposed that cancer patients should be isolated in separate quarters, preferably outside of cities and towns. Abdominal distention (ascites) was observed in cancer patients by Jean Riolan (1577-1657), a French physician. He recommended paracentesis for the relief of abdominal distention as often as needed. However, he had no suggestions for treatment beyond his newly invented procedure.¹⁶

German surgeon Johannes Scultetus (1595-1645) in his *Armamentarium Chirurgicum*, published in 1655,

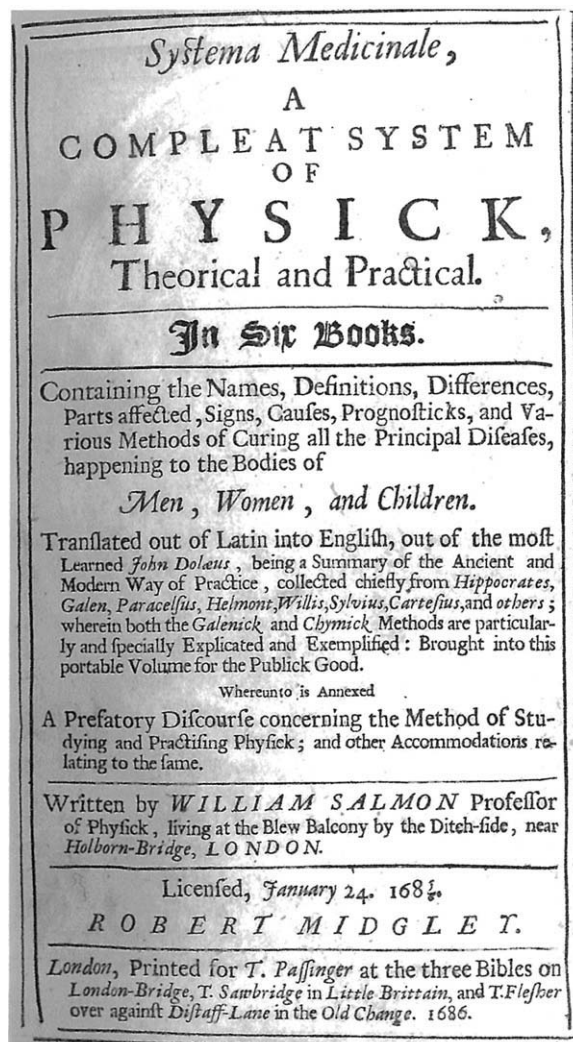


Figure 7. Notice on the title page of Salmon's textbook the ancient English term *Physick*, meaning science of medicine.

described and illustrated surgical treatment of cancers by excision and amputation.¹⁷ He treated breast cancer by mastectomy followed by cauterization to control bleeding and to eliminate potential foci of remaining cancer (Fig. 6). Published articles, notes, and texts of ancient and contemporary physicians and surgeons on tumors and cancers were collected, catalogued, and published in 1678 in a comprehensive volume,¹⁸ entitled *Compleat Treatise of Preternatural Tumors*, by English surgeon John Brown. Brown's text was an addition to a less elaborate collection of published works on tumors by Giovanni Ingrassia (1510-1580) of Naples, Italy, published¹⁹ in 1553.

Mastectomy with excision of axillary lymph nodes (modified radical mastectomy) was described by German

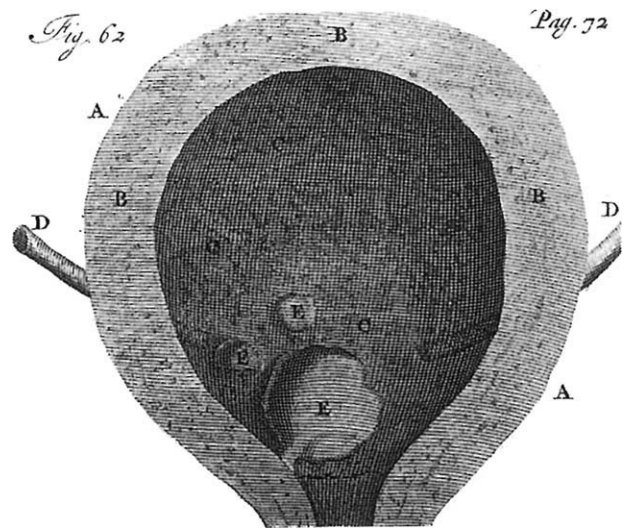


Figure 8. In his 1691 *Observationum*, Ruysch was the first to illustrate papillary bladder tumors.

surgeon Guilielmus Hildanus (1560-1634) in his book, *Opera Observationum*, published posthumously in 1682. He was an advocate of treating cancer at all body sites by radical surgery.²⁰

Practicing physician and London surgeon William Salmon wrote in his 1686 text, *Systema Medicinale*, that cancers were surgical diseases and could be diagnosed at an early stage of growth provided that attention was paid to warning signs²¹ (Fig. 7). He indicated that bloody urine and obstruction of urine flow were caused either by inflammation, caruncle, or cancer. Likewise, he wrote that blood in sputum, cough, and shortness of breath may be due to obstruction of a bronchus by mucus or tumor in the lung. Salmon knew that pulmonary tumors could be primary or secondary, arising from cancers in other parts of the body (metastasis). He held that if the cause of a disease, including cancer, is not known, then its cure will be doubtful.

In 1687, French physician De Saint Andre published in his monograph, *Reflexions*, that cancers were due to accumulation of body secretions such as saliva, bile, pancreatic juice, and menstrual blood. Despite his misconception concerning the role of secretions in carcinogenesis, he observed with perspicacity that acidity in the stomach favors an ulcer and alkalinity favors cancer.²² A series of unusual anatomic lesions and tumors were described and illustrated by Dutch surgeon Fredericus Ruysch (1638-1731) in his book,²³ *Observationum*, published in 1691. In it, there is the earliest illustration of papillary tumors of the urinary bladder (Fig. 8). It is of

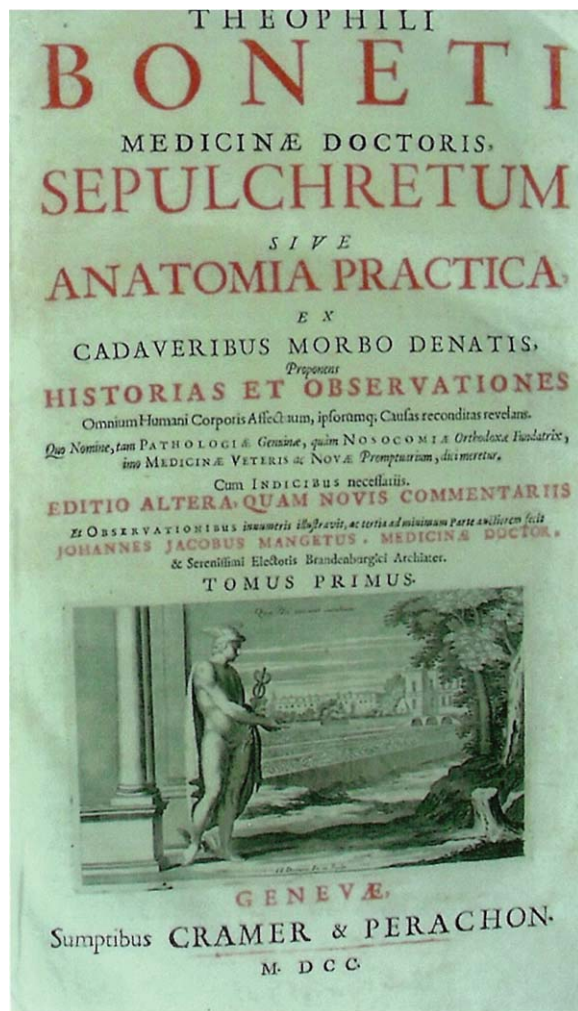


Figure 9. Depicted is the title page of Boneti's *Sepulchretum*, published in 3 volumes in 1700. It contains the largest collection of clinical records and autopsy protocols of cancer patients.

interest that in an era when cutting into the urinary bladder for stones was common practice, he did not offer operative excision of papillary tumors of the bladder. Treating benign and malignant tumors by compression gained ground because of the efforts of Charles Le Clerc (1644-1727), an eminent surgeon in Paris. However, he admitted in his *La Chirurgie Complete*, published in 1695, that when compression failed, surgical excision was mandatory.²⁴

In the year of 1700, 3 influential books were published. Italian physician Bernardino Ramazzini (1633-1714) wrote in his *De Morbis Artificum* about the harmful effects of metals used in various professions.²⁵ He described the damage caused by mercury to surgeons,

L'ORTHOPEDIE OU L'ART

DE PREVENIR ET DE CORRIGER
DANS LES ENFANS,
LES DIFFORMITES DU CORPS.

LE TOUT PAR DES MOYENS A LA PORTEE
des Peres & des Meres, & de toutes les
Personnes qui ont des Enfans à élever.

PAR M. ANDRY, CONSEILLER DU ROY,
Lecteur & Professeur en Médecine au College Royal,
Docteur-Regent, & ancien Doyen de la Faculté de
Médecine de Paris, &c.

Avec Figures.

TOME PREMIER.



A PARIS, RUE SAINT JACQUES.

Chez { La Veuve ALIX, au-dessus de la rue des
Noyers, au Griffon.
LAMBERT & DURAND, à la Sageffe,
& à Saint Landry.

M. DCC. XLI.

AVEC APPROBATIONS ET PRIVILEGE DU ROY.

Figure 10. Shown is the title page of Andry's book, *L'Orthopedie*, published in 1741. With this printing, Andry introduced the term *orthopedy*.

chemists, and pharmacists. Ramazzini called attention to an occupational disease, pneumoconiosis, in masons (stone cutters) and miners and pointed out the virtual absence of cervical cancer and the relatively high incidence of breast cancer in nuns.²⁵

Although up to this time many theories of the origin of cancer were advanced, it was French surgeon Deshaies Gendron (1663-1750) who offered the most realistic view of the genesis of cancer in his book,²⁶ *Recherches sur la Nature et la Guérison des Cancers*. His understanding was that cancers derived from the transformation and continuous growth of glandular, lymphatic, vascular, and solid structures in the body. He was convinced that cancers are untreatable with drugs and that wide surgical excision was the only curative treatment. Gendron was familiar with

CAUTIONS Against the immoderate Use of SNUFF.

Founded on the known Qualities of the
TOBACCO PLANT;
And the Effects it must produce when this
Way taken into the Body :

AND

Enforced by Instances of Persons who have
perished miserably of Diseases, occasioned,
or rendered incurable by its Use.

By Dr. J. HILL.

THE SECOND EDITION.

L O N D O N :

Printed for R. BALDWIN in Pater-noster Row,
and J. JACKSON in St. James's-street.

MDCCLXI.

Figure 11. Hill's warning in 1761 about the danger of immoderate use of tobacco was alarming news and called for instantaneous reprinting of his monograph.

cancerous degeneration (metastasis) that often followed initial localized growth of cancer. He deemed such cancers incurable, and he offered no treatment.²⁶

The third publication of note in 1700 was the text, *Sepulchretum sive Anatomia Practica*, by Swiss physician Theophilus Boneti (1620-1689). He collected more than 2000 autopsy reports and corresponding clinical records from the notes of his contemporaries and earlier physicians and surgeons and added his own cases and those of his associates to this collection. The amassed material of 2806 cases was published in 3 volumes containing 2260 pages²⁷ (Fig. 9) 11 years after Boneti's death. On cursory review and translation into English from the original Latin, one can find 43 case reports that contain information that can be viewed as descriptions of cancer.²⁸ Among these cancer cases, there are cancers of the brain,

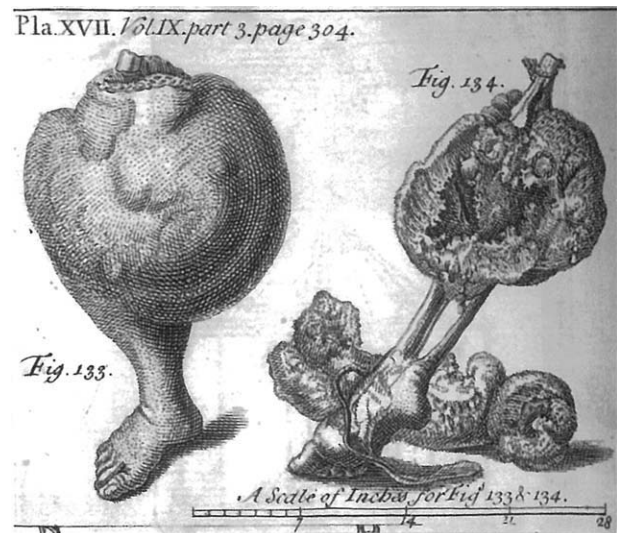


Figure 12. Above-knee amputation of the right leg of a 25-year-old man, before and after dissection, is illustrated. The tumor has been described as a rapidly growing tumor with bony consistency of the proximal tibia, most likely osteosarcoma. This is the first illustrated case report of a malignant tumor in a periodical.³⁷

head and neck, lung, breast, esophagus, stomach, colon, liver, pancreas, kidney, uterus, cervix, bladder, and prostate. Cases consistent with abdominal carcinomatosis from an unknown primary and a probably malignant lymphoma are also described.²⁸ By tradition, most autopsies were limited to the clinically suspected diseased organs. Therefore, it is not a surprise that metastases were often missed or remained unrecognized. In addition to the 43 cancer cases, Boneti's volumes contain a storehouse of original observations on many benign tumors and medical and surgical conditions. Boneti introduced many new terms, including *papillomatosis*, *carcinomatosis* (local metastasis), *miliary spread* (distant metastasis), *carcinomatous dropsy* (malignant ascites), *strumatosi* (lymphoma), and *carcinoids* (small carcinomas). Despite all the shortcomings of Boneti and his contemporaries, by correlating the results of their clinical and postmortem examinations of cancer patients, they established the foundation for tumor pathology and clinical oncology.^{27,28}

The routine use of the microscope for diagnosis of tumors and other diseases was first suggested by English physician Michael Etmullerus (1644-1683). In the expanded edition of his *Complete System* published posthumously²⁹ in 1712, he warned that chronic cough may be caused by cancer in the lungs or bronchi and that swellings at the joints may due to cancer (sarcoma). Etmullerus knew that cancer occurs in internal organs. For

Table 1. Chronology of Discoveries, First Descriptions, New Terms, and Other Salient Events

Year	Medical History	Year	World History
1478	The first medical book printed	1450	Movable type printing
1507	First printed case report of a gastric cancer	1517	Luther publishes his Ninety-five Theses
1530	Systematic therapeutic use of chemicals introduced; industrial lung cancer described	1532	Suleiman besieges Vienna
1543	Vesalius' anatomic atlas published	1543	Copernicus' book on rotation of the earth
1553	All printed works on cancer collected and published	1553	Servetus, discoverer of pulmonary circulation, burned at the stake in Geneva, at order of Calvin
1555	The terms <i>physiology</i> and <i>pathology</i> introduced; first pathology book published	1564	Michelangelo dies; Galileo and Shakespeare born
1575	Breast cancer treated with mercury-covered sheet of lead	1584	Raleigh discovers Virginia
1597	Wide excision of all tumors proposed	1590	Janssen invents single-lens (simple) microscope
1614	First brain tumor described and examined	1611	King James Bible published
1620	Warning about immoderate use of tobacco	1620	Mayflower sails with Pilgrims to North America
1628	Harvey discovers blood circulation	1626	New York founded
1632	Tumors of testis, ovary, breast, and extremities described and illustrated; fibroadenoma recognized as a benign breast tumor; surgical pathology is born	1630	Building of Taj Mahal in India began
1649	Cancers named contagious and patients isolated	1644	Quakers founded
1651	Bartholinus discovers the intestinal lymphatics	1650	Tea first drunk in England
1653	Paracentesis introduced	1652	First opera house built in Vienna
1655	Mastectomy followed by cauterization	1654	Portuguese take over Brazil
1658	Kirscher is the earliest user of microscope in medicine	1658	Swammerdam observes red blood corpuscles
1666	Malpighi described nodular enlargement of spleen	1660	Royal Society founded
1682	Modified radical mastectomy introduced	1667	Hooke introduces the term <i>cell</i> by studying plants
1686	Blood in urine or sputum may indicate primary cancer in the bladder or in the lung	1677	van Leeuwenhoek discovers striated muscle and bacteria
1687	Gastric acidity favors ulcer and alkalinity favors cancer	1689	Massacre of settlers in Canada by Indians
1691	Illustration of papillary bladder tumors	1691	Directory of addresses printed in Paris
1695	Benign and malignant breast tumors treated by compression	1696	China conquers Mongolia
1700	Breast cancer rare and cervical cancer common in nuns; Cancers derived from continuous growth of anatomic structures; Local growth of cancer is followed by metastasis	1700	Foundation of St Petersburg, Russia
1700	Cancers of the brain, head and neck, lung, breast, esophagus, stomach, colon, liver, pancreas, kidney, uterus, cervix, bladder, and prostate found at autopsy; local metastasis, distant metastasis, carcinomatous ascites and lymphoma-like disease described; the term <i>carcinoid</i> introduced	1707	Union of England and Scotland
1712	Chemicals and concoctions of powders used before attempts of surgery; routine use of microscope	1714	Fahrenheit constructs mercury thermometer
1719	Radical mastectomy and lumpectomy described	1718	New Orleans founded
1722	Surgery of cancers of internal organs and the penis; Guy's hospital founded in London	1721	Kew Gardens opened in London
1723	Osteosarcoma of bone described and treated by amputation	1728	Behring discovers Alaska
1740	The first cancer hospital established in France	1739	Notes on Sunspots published
1741	The terms <i>orthopedy</i> and <i>chloroma</i> introduced	1741	Behring dies of hunger, cold, and neglect
1742	Cancer is caused by concentration of body secretions and inflammation	1742	Celsius invents centigrade thermometer
1747	Unusual cancers reported in illustrated case reports in the first scientific periodical by the Royal Society	1749	Sign language for deaf-mutes invented
1761	Tobacco snuff causes cancer	1756	Birth of Mozart

curative purposes, he used several remedies of unusual nature. His favored concoction consisted of fermented powder of crab's eye, red coral, salt of tartar, oil of clove, and opium.^{5,29} If medications failed to stop the growth, then he resorted to surgical removal of the tumor.

Francisco Suarez, a Spanish surgeon, recommended the opposite.³⁰ He advised treatment of deep cancers and cancers of internal organs surgically because surgeons were familiar with anatomic structures such as nerves and vessels. However, for superficial cancers, for example cancer of the buccal mucosa, uterine cervix, and the penis, he used powder of jalapa or balsamic and mercurial solutions to induce cicatrization.

Lorenz Heister (1683-1758), who is regarded as the founder of German surgery, routinely performed post-mortem examination of his deceased cancer patients. Autopsy findings gave him the idea that breast cancer should be treated by removal of the breast, axillary lymph nodes, and the pectoralis major muscle³¹ (radical mastectomy). Heister in his *Chirurgie*, published in 1719, also described and demonstrated how to perform excision limited to the cancer (lumpectomy). French surgeon Jean-Lewis Petit (1674-1750), despite his specialization in treating diseases of bones, was the primary advocate in France of radical mastectomy. In his 1723 book, *Traite des Maladies de Os*, he described osteomalacia, chondromatosis—including the familiar one—chlorosis, and intramedullary sarcoma with bone formation (osteosarcoma). Petit felt that medical remedies were of no use and all bone tumors should be treated by amputation.³² Another French surgeon, Nicholas Andry (1658-1742) also specialized in bone diseases and described several forms of skeletal malformations, bone tumors, and chloroma. Above all, by publishing his 1741 monograph entitled, *L'Orthopedie*, he introduced the term *orthopedy*.³³ (Fig. 10).

Stagnation and coagulation of body secretions, particularly of lymph, and bad substances in water and in the soil were regarded as causes of cancer by Hermann Boerhaave (1668-1738), a Dutch physician,³⁴ and Jean Astruc (1684-1766), a French physician.³⁵ Both of them felt that chronic inflammation played a crucial role in the induction of cancer because inflammation blocked the excretory ducts of glands. They named breast cancer as a typical example. Astruc pointed out the need for new techniques for distinguishing inflammatory (reactive and infectious) ulcers and cancerous ulcers. He is also remembered for carrying out a self-experiment by comparing the taste of cooked breast cancer and beef. He found no difference in taste.³⁵ To the satisfaction of many physicians and sur-

geons, the role of local irritation and inflammation in causation of cancer was confirmed by London surgeon John Hill (1716-1775). In his 1761 book,³⁶ *Cautions Against the Immoderate Use of Snuff*, he wrote that tobacco snuff is able to produce swellings and polyps in the nose. He had personal experience with 6 such cases, 2 of which changed to ulcerated cancer, after their many years of using a large quantity of snuff (Fig. 11). In his text, Hill also confirmed the validity of the concern of Thomas Venner, who had described the danger of immoderate use of tobacco 150 years earlier.^{10,11}

In the 1700s in the official publication of the Royal Society of London, *The Philosophical Transactions*, clinicopathology case reports of unusual tumors were introduced. Among the tumors reported were breast cancer, bilateral ovarian mucinous cancer, cancer of the testis, and sarcomas of the femur and the tibia. Printing of such cases signaled the beginning of publication of case reports in medical periodicals³⁷ (Fig. 12).

Reflecting on this narrative of landmarks in the history of cancer during a period of 250 years, it should be recognized that the achievements and failures of physicians and surgeons did not take place in isolation. They were tied to discoveries and omissions of numerous pioneer scientists, including Andreas Vesalius (1514-1564), William Harvey (1578-1657), Athanasius Kircher (1602-1680), Thomas Bartholin (1616-1680), Marcello Malpighi (1628-1694), Robert Hooke (1635-1703), and Antony van Leeuwenhoek (1632-1723).

In conclusion, the emergence of tumor pathology, surgical oncology, and medical oncology can be traced to medical events that took place between 1500 and 1750 (Table 1).

CONFLICT OF INTEREST DISCLOSURES

The author made no disclosures.

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