

## Oncologic conceptions of Ambroise Paré (1509-1590), father of surgery

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### Summary

*Ambroise Paré, one of the leading surgeons of the 16th century, is acknowledged as the father of surgery. He exercised vast influence on several fields of medicine and surgery*

*through his writings. This article presents and criticizes Paré's conceptions on oncology.*

**Key words:** oncology, Paré, surgeon

### Paré's life and career

Paré was born in the little town of Laval in the Province of Maine in northern France. Paré's father and a paternal uncle were barber-surgeons, the lowest level in the medical hierarchy. Surgeons formed the fraternity of St. Cosmas and concerned themselves with the treatment of wounds, cauterization, the lancing of abscesses and the application of ointments and plasters. Major operations were entrusted to these modest practitioners, who, besides shaving their customers, used to let blood by applying leeches or cupping vessels. Paré may have begun the study of surgery with his brother and it is certain that he did work with a barber-surgeon in the provinces before going to Paris. In Paris, he was appointed apprentice barber-surgeon at the Hôtel Dieu, where he worked for the next 3 or 4 years and must have gained great experience [1].

Perhaps because he could not afford to pay the fees for admission to the ranks of the barber-surgeons, Paré started his career at the age of 26 as a military surgeon. He was appointed surgeon to the Maréchal de Montejan, who was Colonel General of the French infantry. After the Peace of Nice (1538) he returned to Paris. In 1541, he passed his examination and joined the college of barber-surgeons. In the same year he also married.

In the first engagement during the Piedmont campaign a badly wounded officer was brought to Paré. The young surgeon saved his life; when he was asked what he had done, he replied, «I treated him and God healed him». This phrase, with its expression of faith in the healing powers of nature, was engraved on his tombstone [2].

Paré's (Photo 1) reputation was now so great that he was made a member of the respected College of Saint Côme. This was something exceptional for a surgeon who had no formal education. Moreover, the



**Photo 1.** Paré at the age of 40.

College was so extravagant as to exempt him from the rather high membership fee. Paré gave his inaugural lecture in French, instead of the usual Latin, and he was duly mocked by the envious. Yet Paré was no stranger to Latin. His close reading of Vesalius was documented in a larger edition of his anatomy book *Anatomie Universelle du Corps Humain* elaborated for surgeons and published in 1561. It had the enormous significance of making Vesalius well-known among surgeons.

This is all the more amazing because he was a councillor of state and surgeon to 4 kings of France, Henry II, Francis II, Charles IX and Henry III, in an age when each king's courtiers were normally purged by the next, and when horrors such as Saint Bartholomew's Night and the Huguenot Wars took place. But Paré (Photo 2) was considered much too valuable. It is said that king Charles IX himself once hid Paré in his own bed [3].

Paré published his extensive writings not in Latin (which he never learned) but in his native French so that the humblest surgeon apprentice could learn from them. Reading some examples of his writings, one is

not surprised at the popularity of his numerous books, whose publications were spread over his long life, from his first *The Method of Treating Wounds Made by Firearms* in 1545, a little work of 64 pages illustrated with 23 figures, to his *Apologie and Treatise Containing the Trips Made in Divers Places* in 1585 [4].

The *Oeuvres* (Works) of Paré was published in 1585. The completed text was titled *Oeuvres de M. Ambroise Paré, Conseiller et Premier Chirurgien du Roy* (Photo 3). Once again, this was found shocking by the medical faculty in Paris.

The Dean of the Medical School attacked Paré for using French instead of Latin and invoked a seldom-used statute stating that no medical works could be published without the expressed approval of the faculty. Even Paré's fellow surgeons of St. Côme sought unsuccessfully to have the publication banned by an act of Parliament. Paré proceeded to write a lengthy denial of the faculty's authority in his *Apologie Et Voyages* (1585), his last work, which was in many aspects an autobiography and revealed much of Paré's true nature.



Photo 2. Paré at the age of 75.

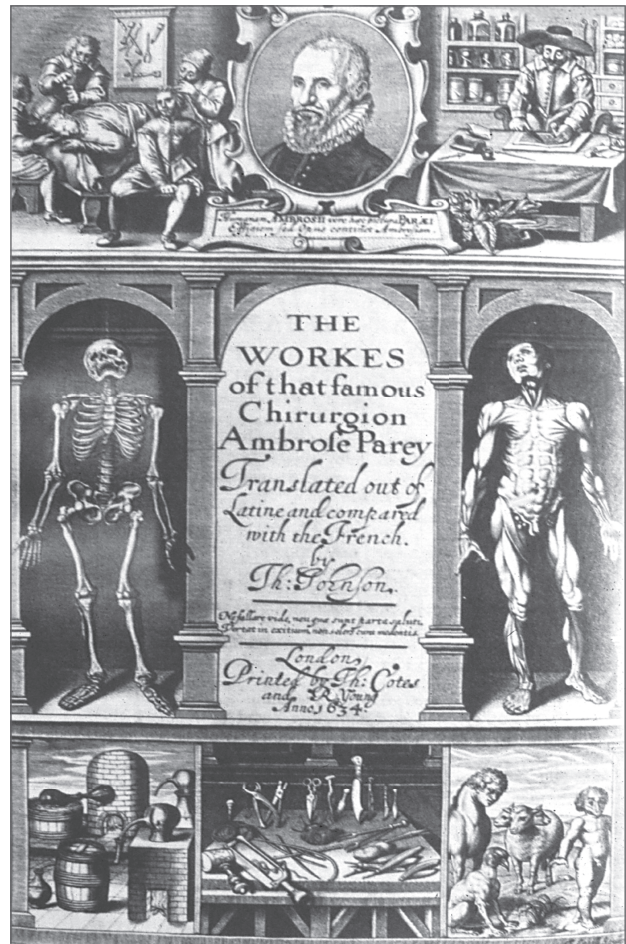


Photo 3. The title page of the first English edition, which, as the title page advertises, was made not from a French edition but from a Latin translation.

Paré went from fame to fame and dominated the history of surgery in the 16th century (Photo 4). He died at the age of 81 in Paris where he had always lived as a simple, humble man.

### Paré's writings and contributions on surgery

In 1537, Paré made his fundamental observations on the treatment of gunshot wounds. The background was that all authorities of the age considered shot wounds poisonous, and had no other means of saving the patients than to burn them with boiling oil.

Paré soon realized that the accepted method of treating these injuries with boiling oil did more harm than good and substituted a more humane and less destructive dressing.

He also went on to show that bleeding after amputation of a limb should be stopped not by the terrible method of a red-hot cautery, but by simply tying the injured blood vessels. Ligation of blood vessels was known to the ancients, and Paré's only claim, as he makes quite clear in his own writings, was that he was the first to apply this technique in performing amputations. He first employed the ligature in the amputation of the leg in 1552 at the siege of Danvillier but did not publish his technique until 1564 [5].

As a result of Paré's initial battlefield experiences and the urgings of Jacques Dubois (in Latin Jacobus

Sylvius, 1478-1555), Paré authored a short treatise on the treatment of gunshot wounds, *La Méthode De Traicter Les Playes Faictes par Hacquebutes Et Aultres Bastons A Feu: Et De Celles Qui Sont Faictes Par Flèches Et Semblables* (1545). This small practical volume, written largely for Paré's fellow barber-surgeons, was the first in a lifetime of voluminous writings.

Paré was strongly convinced of the importance of anatomy as a prerequisite to a surgeon's skills. Consequently, after his return from a second field campaign (1549), he began work on another treatise dealing with surgical anatomy. This work, titled *Briefve Collection De L' Administration Anatomique*, was important because it also contained sections on obstetrics in which Paré encouraged a revival of podalic version, once described by Soranus of Ephesus, and had the courage to recommend that artificial labor would be induced in cases of uterine hemorrhage.

Paré wrote an epitome of Vesalius's *Fabrica*. By making the work of Vesalius popular and accessible to surgeons, Paré had a major effect on Renaissance surgery. The influence of Vesalius is quite apparent in Paré's anatomical text, *Anatomie Universelle Du Corps Humain* (1561), especially in the illustrations [6].

Paré presented new methods of locating the shot that remained in a wound. They were based on logical and intelligent interpretation of the signs of the shot's direction of entry.

He invented new surgical instruments, including hemostatic forceps, a truss for hernia, and was interested in the problem of cripples, for whom he devised ingenious artificial aids. He also improved the hernia band, which had never been of much use before.

In most instances, the free or cut end of a blood vessel was doubly ligated and the ligature was allowed to remain undisturbed *in situ* until, as the result of local suppuration, it was cast off. Paré described this work in his *Dix Livres De La Chirurgie Avec Le Magasin Des Instruments Nécessaires A Icelle* (1564).

In addition, he bitterly condemned any surgeon, itinerant or otherwise, who castrated a patient during herniorrhaphy. Paré performed a staphyloplasty, did the first exarticulation of an elbow joint, described fracture of the neck of the femur, and suggested syphilis as a cause of aneurysm.

His work in dentistry, including the reimplantation of teeth, the restoration of missing teeth, and the invention of a palatal obturator, is of major significance.

Other important topics included a description of carbon monoxide poisoning and a short treatise on medical jurisprudence. Later in life, Paré wrote on other topics, condemning the "hobby-horses" of academic doctors, such as mummy-powder and pulverized



**Photo 4.** Paré with Andreas Vesalius at the deathbed of Henry II. The two men stand behind the table; Vesalius on the right. The French king suffered a lance blow above his right eye in a medieval-style tournament with the Count of Montgomery.

unicorn horn. Similarly, he devoted a separate chapter to bezoar stones. His most curious work was a treatise on terrestrial and marine monsters (1573), an early contribution to teratology.

## Cancer in the *Works of Paré*

### A. *The scirrhus*

We have now to treat tumors coming from the black bile. There are of several kinds: the first one that is the true scirrhus is a solid painless tumor, done by natural bile; the second one is the false scirrhus, a solid painless tumor product of a too big resolution or refrigeration; the third one is the ulcerated scirrhus, done by corruption; the fourth one is the mixture of natural bile and other humors.

The cause of these tumors is a thick, accumulated and hardened in some places humor: it originates from poor dietary habits, from liver or spleen diseases, from obstruction or suppression of hemorrhoids and from menses. In the beginning, these tumors appear small, but they grow quickly from day to day [7].

### B. *Treatment of scirrhus*

The scirrhus treatment will be achieved in three points. The first one concerns the diet: it must be abstemious with a tendency to humidity; the second one will discharge the antecedent material by phlebotomy, purgation, provoking hemorrhoids in man and menses in woman. The third point will be accomplished with local drugs, emollients at the beginning, solvents later.

The Vigo's plaster is excellent to soften, melt and resolve the scirrhus tumors. Christoffle Landré assures that he tested the goat dungs in order to treat this disease and, for his words confirmation, he quotes Galen's testimony [Paré, op. cit. Ch. XXVI].

### C. *The canker (ulcerous cancer)*

Canker is a solid, rough, round tumor, grayish or pallid, surrounded by several veins of blood bile, which are visible and twisting like a crab.

At the beginning, canker is difficult to be recognized because it looks like a bean or a small hazelnut. While it is growing, torments the patient with an insupportable pain [Paré, op. cit. Ch. XXVII].

### D. *Causes, types and diagnosis of canker*

There are two causes: the antecedent and the conjugated. The antecedent originates from the diet, liver

or spleen disease, suppression of menses and hemorrhoids.

The conjugated is caused when the humoral bile is blocked in a part after being boiled. We distinguish the non-ulcerated canker from the ulcerated one. The bilious and those using the aliments for humor production are predisposed to cankers formation; women more than men, as well as those having warm liver.

The canker is almost incurable but certain persons that were affected lived for a long time, which is proved by the testimony of Hippocrates. So we use a palliative course of treatment by harmless, soft and lenitive remedies [Paré, op. cit. Ch. XXVIII].

### E. *Treatment of canker at onset*

We can prevent the canker growth (as Galen says). We have to prescribe drugs that purge the bilious humor and we can proceed to blood-letting if the age and the forces of the patient can tolerate it. Also, we have to avoid everything that generates this thick and muddy humor. Likewise, it is necessary to provoke the menses in a woman or a girl that are supposed to be in age to have them and the hemorrhoids in case that the patient is predisposed to them.

In his diet, the patient has to avoid everything that can heat the blood; preferably he has to consume foods that cool and moisten.

He has to reject the sour, salty foods and the overcooked bread, cabbages, old cheeses, beef, stag, goat, hare meat, garlic, onion, and the mustard.

He has to eat vegetables soups and foods with good juices: all kinds of birds, except water birds, fish, soft-boiled eggs, white and red light wine. The side where the canker is situated must be treated gently, it must not be loaded with hard and heavy materials or with solid and oleaginous plasters. On the contrary, we'll apply lenitive liniments, using in intervals venomous remedies, as the theriaque and the mithridate. Consumption of donkey milk softens a lot the acidity of the humor. If the canker is ulcerated, the ulcer will be washed away with this milk [Paré, op. cit. Ch. XXIX].

### F. *Treatment of the ulcerated canker*

The ulcerated canker has common signs with the rounded tumor which is unequal or rough, and with pains. The tumor feels soft, but it is hard to touch. When it ulcerates, it has big, hard, nodular edges and it is horrible to see; it throws a foul-smelling liquid that sometimes is black, sometimes turns to brown or bloody. It is accompanied by a slow and continuous fever and often the patient falls in syncope. If we'll ap-

ply there a pungent and caustic remedy we'll irritate it more, so that the pain, the fever and the other troubles will be increased. The body debilitates and death follows. Therefore, some called such cankers "noli me tangere", meaning "do not touch me with any rough and strong thing" [Paré, op. cit. Ch. XXX].

#### *G. Treatment of canker by the manual activity of surgeon (Surgical treatment of cancer)*

If the canker is small-sized and is located in a place that can suffer amputation, it is necessary, before to put the hand, the patient to be well purged and blood-letting. After the evacuation, we'll cut and we'll remove the corrupted material, we'll cut a little more so that no affected portion will remain. We'll leave the blood to flow in order to unload the veins from the bilious humor. Then, we'll apply a cautery that will strengthen the place and will stop the bleeding. That done, we'll administer sedatives and we'll proceed as in the treatment of the others cankers. We'll know that the canker was completely eradicated and the malignancy was faded when we'll see a flesh to grow under the form of small grains of pomegranate and the patient will be free of pain and other troubles [Paré, op. cit. Ch. XXXI].

#### *H. Local remedies for the treatment of canker*

At the beginning, we will use repercussive agents: the diachylon dissolved with golanum juice and a little of attar of roses is suitable for the non ulcerated canker. The washed pompholyx in golanum juice or in plantain is beneficial to those that are ulcerated.

If the patient suffers a lot, we will apply leeches to the places where he feels a punch like pain: by evacuating the blood, the place will be relieved from the malignant humor that created the suffering. Another remedy: take alive puppies or newborn kittens or young pigeons or chickens, cut them lengthwise and apply it on the canker, renew it when the patient feels that it is getting cold.

I have noticed several times that the natural heat of these animals give up the pain. Also we can use egg oil well beaten in a lead mortar until it becomes thick and we'll add a little camphor and powder of roasted crayfish. If the canker is located in the uterus, the patient feels pain to the groins, on the pubis, in the kidneys and has difficulty to urinate. If it is ulcerated, it throws a black serous foul-smelling, cadaverous liquid. Often, the patient falls in syncope because of the putrid vapors that are going to the brain and to the heart and we have to relieve him by administering special rem-

edies as the theriaque, the mithridate, etc. We'll apply compresses on the heart region and the diet must be meagre, refreshing, based in sour tart foods, in order to annoy the putrefaction of humor. The uterine canker is incurable because we cannot eradicate it and apply the proper remedies; hence, it is necessary to administer a palliative treatment in order to relieve from pain.

Thus, we'll take a half ounce of ceruse washed four times in rose water, a drachma of camphor and of burnt lead, a half drachma of Armenia bowl; we'll incorporate them with golanum juice, water lily oil and white wax and we'll prepare an ointment that we'll apply on the affected areas and to the proximal ones.

We'll use also pessaries and injections made of oak-tree juice and of purslane. Then we'll put an instrument on the cervix in order to evacuate easily the liquid and to give perspiration to the vapors and to the putrid matters.

The non ulcerated cankers are very well treated by lead strips rubbed with money, which is confirmed by Galen (book 9 *Des simples*).

I began to treat the queen's mother lady of honor Madame of Montigny, suffering from a canker sized as a walnut in the left breast. But after two months, she lost patience and counseled another doctor. This one condemned my remedies and applied hot and attractive medicines: suddenly the tumor increased and the breast became big as an overripe pomegranate. It occurred a blood flow so violent that the doctor had to apply caustic powders in order to staunch it. These increased the pain, the inflammation, and the death followed soon. The doctor had held his promise to heal this person, but he did harm [Paré, op. cit. Ch. XXXII].

#### *I. Fever associated with scirrhus tumors*

Ordinarily this fever is quartan. The primary causes are those that generate the bilious humor, as the extended use of vegetables, brown bread, salty meats, quarry, old cheeses and thick wines.

The antecedent causes are the abundance of bilious humor in all the veins. The conjugated causes are the putrefied bilious humors outside the big vessels. The treatment consists in diet and medicines. The patient must not consume pork meat or flatulent foods, viscous and slimy. He must not eat water birds or salty fishes or quarry. The consumption of lightly heated white wine is good to alleviate the bilious humor, to provoke urination and sweats.

At the beginning of the attack, it exists the vomiting which is essential for the cure of the quartan fever: only with this, several patients have been treated. The exercises and the frictions before the meal are good. At

first, it is necessary to treat the patient gently and not to use drastic medicines. If the blood is abundant, it is necessary to draw it from the basilic or median vein: black and thick, we'll leave it to flow; on the contrary if it is light and well colored, it is necessary to stop it quickly.

I declare here to have been involved, with the assistance of God, in the treatment of several suffering patients from this fever by administering to them at onset, 3 fingers brandy mixed with a little of theriaque or 2 or 3 grains of musk dissolved in malvasia wine [Paré, op. cit. Ch. XXXIII].

## Discussion

Paré played a major role in reinvigorating and modernizing Renaissance surgery. He represents the severing of the final link between surgical thought and techniques of the ancients and the push toward the modern era.

That Paré eventually decided to start writing was due to the inaccurate statements committed to paper by a traditionalist, Etienne Gourmelen, who attacked Paré in a long diatribe, criticizing in particular arterial ligation. "How dare you teach me surgery", Paré replied, "You who have done nothing all your life but look at books! Surgery is learnt with the hand and eye. And you - *mon petit maître* - all you know is how to talk your head off, sitting comfortably in your chair". Paré was already famous when he began writing, and he found pleasure in giving a full account of his experiences as a surgeon and in war.

Although other surgeons had made similar observations about the difficulties inherent in using boiling oil on fresh gunshot wounds, Paré's ability to articulate this finding in both written word and clinical practice brought him lasting fame and glory.

It is a tribute to Paré's remarkable career that he became chief surgeon to four successive kings of France. Viewed in the context of Paré's humble background and training as a barber-surgeon, his achievements were overwhelming. Paré demonstrated true humility in his work with his patients and, in the world of healing, a humility most evident in his most remembered statement: «*Je le pansay. Dieu le guérit*». (I treated him. God cured him).

Paré, until his death in 1590, continued to revise his collected writings first published in 1585. Four editions were revised by the author and numerous reprints and translations appeared during the following century.

In his *La Méthode de Traicter les Playes Faictes*

*par Hacquebutes* (Method of Treating Wounds Made by Firearms) of 1545, Paré concocted an ointment (or digestive) from egg yolk, rose oil, and turpentine, which he applied to the wound. The mixture proved successful. Wounds treated with Paré's digestive were less painful, did not swell up, and generally remained uninflamed. Concluding that gunshot wounds did not automatically require cautery - this should be reserved for gangrenous wounds or used as a means of stopping bleeding in infected wounds - Paré abandoned the hot-oil treatment.

Like many innovators of the Renaissance, Paré combined a modern, empirical scientific spirit with true credulity.

In the field of cancer, Paré's operating method for the external cancers is rather original, but its conceptions on cancer present interest only in the measure where the father of modern surgery embodies the entire medical thought of his time through a "vulgar" language that does not lack neither of flavor nor of panache.

The seventh book of Paré's *Oeuvres* (Works) refers to *Tumeurs contre nature en général* (Tumors against nature generally). He distinguishes the tumors coming from the blood, the sputum and the bile (phlegmons, abscesses) from those generated by melancholy: Scirrhus, cankers (ulcerous cancers), crabs or cancers.

The scirrhus, he writes, is a solid, painless tumor "with a small feeling made by the natural melancholy". It proceeds from a "big humor, gluey and dull" and from "a poor life regimen". It can be degenerated in cancer but it is curable if we will treat it from the very beginning. Sometimes it doesn't develop for years. There is no doubt that under the name of scirrhus Paré designates the benign tumors such as the adenomas, cysts or lipomas. On the other hand, the canker or cancer appears in a silent and perfidious way before devouring his prey: "To the beginning it is very difficult to be noticed, as the tumor looks like a small bean, or like a small hazelnut which grows rather sudden, in case that we apply some remedies that irritate it, and begins without pain: but as it enlarges, provokes an intolerable and poignant pain to the patient, with a strange heat sensation".

Like the scirrhus, the main cause of cancer is a thick blood, silty and melancholic. The liver capacity to produce it and the spleen incapacity to evacuate it is the second cause. Also women that have warmer liver than men are at a greater risk.

The cancer does not develop only "in shameful places and in the breast" but also in the intestines, in the mesentery, in "spongy and glandular" places and in all the emunctories that are likely to attract and to keep melancholy.

Sometimes occult, it starts to ulcerate, and “this is horrible to see, throwing a serous, suppurative liquid, foul-smelling and cadaverous, sometimes black, sometimes brown or bloody”. All kinds of cankers, neglected or ulcerated, “are incurable or very difficult to be cured” and for all the cancers Paré applies the *noli me tangere* formula. To the bloody operation, which one must practice only in small-sized cancers, he prefers the purgation, blood-letting and diet.

The plasters worsen the beast’s “wrath”, but the applications of donkey milk have soothing properties. The patient must abstain finally “from too big abstinence, insomnia, excessive work, sadness, concern”.

At Paré’s era, doctors and surgeons that practiced surgical removal of breast cancer or of other superficial cancer types lived in the dread of local relapses. But all ignored that a cancer, apparently eradicated in *lege artis* way, could expand, colonize and affect other regions in the body.

It was Girolamo Fabrizio of Acquapendente (1537-1619) who suspected the metastasis mechanism. He showed for the first time the metastatic spread frequency, particularly in the liver, the intestine and the uterus, after the tumor had been removed [8].

Then, a new stage in getting a clearer picture of cancer and its underlying peculiarities had begun.

## Conclusion

Paré’s integrity, judgement, technical skill and

moral courage made him one of the outstanding surgeons of all times. One of Paré’s most important contributions to medicine was the study and treatment of tumors. Paré, through his writings, greatly influenced progress in the management of tumors.

## References

1. Androutsos G. La lithiase urinaire et son traitement par Ambroise Paré (1509-1590). *Progrès en Urologie*, 2004; 14: 109-117.
2. Margotta R (Ed). *The History of Medicine*. Hamlyn, Reed International Books Limited, London, 1996, pp 89-91.
3. Ellis H (Ed). *A History of Surgery*. Greenwich Medical Media, London, 2001, p 84.
4. Haeger K (Ed). *The Illustrated History of Surgery*. Harold Starke, London, 1989, pp 107-112.
5. Rutkow I (Ed). *Surgery. An Illustrated History*. Mosby Year Book, St Louis, Missouri, USA, 1993, pp 168-171.
6. Porter R (Ed). *The Cambridge Illustrated History of Medicine*. Cambridge University Press. Cambridge, United Kingdom, 1996, pp 206-207.
7. Paré A (Ed). *Oeuvres d’Ambroise Paré. Remises en ordre et en français moderne par Roger-Henri Guerrand & Fernande de Bissy*. Union Latine d’Éditions, Paris, 1980, 4 vols, t. 1, L. 7, Ch. XXV, p 279.
8. Darmon P (Ed). *Les cellules folles. L’homme face au cancer de l’Antiquité à nos jours*. Plon, Paris, pp 33-34.

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