

A Classical Wooden Vaginal Speculum Mentioned in Old Medical Manuscripts

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Abstract

The subject of this paper is the story of an ancient medical instrument. This instrument is a wooden vaginal speculum used in classical and Islamic medicine. Its drawings can be found in Abulcasis al-Zahrawi's and Şerefeddin Sabuncuoğlu's illustrated books of surgery.

Keywords: History of gynecology and obstetrics, history of medicine, history of medical instruments

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Introduction

The word speculum, Latin for “mirror”, is used for devices that allow us to examine and treat tubular body parts with a lumen located beyond introductory orifices, by pushing the walls apart from the inside.¹ Vaginal speculum is the most commonly used type. A vaginal speculum enables us to see the cervix uteri, rendering possible the diagnostic and therapeutic processes related to that part and the inside of the uterus.

Vaginal speculum, the main instrument of gynecological examination, has a long history, reflecting the coevolution of medicine and medical technology. It is an interesting device with a multitude of variations from the past to the present. The oldest example of vaginal speculum was found in a surgeon's house in Pompei, which is now in Naples National Archaeological Museum.^{2,3} Today, the parts of the vaginal speculum entering into the vagina and spreading it apart consist of two pieces, whereas three-piece models were used in the past. A bronze speculum was found in Anatolia and published by Kunzl, which was an assembly of screws, a typical example of these instruments.³

The use of the speculum was mentioned in the works of Hippocrates [circa 460 – 370 BC] in general terms. However, Soranus of Ephesus [circa 98 – 138] was the first who specifically mentioned the vaginal speculum.^{4,5} Soranus described the vaginal speculum in a detailed way in *Gynaikaia*.⁵ In this book focusing on obstetrics, even though some drawings are present, none of them shows the vaginal speculum.⁵ The use of the vaginal speculum, which started as part of the traditional Greco-Roman medicine, continued with the Islamic medicine pursuing the same tradition. Vaginal speculum was then called by odd names such as “diopter”, “katopter”, “lawlab” (screws) and “miftah-ul ferc” (vulva opener).⁵⁻⁷

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In the 6th century, Aetius of Amida [6th century] mentioned the vaginal speculum in his works. In the 7th century, Paulus of Aegina [circa 625 – 690] noted employing the vaginal speculum for diagnosis and treatment of cervical diseases and described the medical procedures for treatment of cervix uteri using this device. In the Islamic medicine, Ali ibn Abbas Majusi Ahvazi (Hally Abbas) [circa 949 – 982] described how to use the speculum in situations related to gynecological diseases and childbirth. In his book, İbn Sina (Avicenna) [circa 980 – 1037] referred to use of a mirror reflecting the light with a vaginal speculum for the first time and explained the symptoms and treatments of gynecological diseases.⁸ All the authors note that the size of the vaginal speculum should be chosen based on the patient's age and body type. Authors also mention that the vaginal speculum is used in surgical treatment of lesions located in the vagina and cervix uteri such as abscesses and tumors.^{5-7,9}

The first drawing of a vaginal speculum was illustrated in the “*Kitab At-Tasrif (On Surgery and Instruments)*” of Abulcasis Al-Zahrawi [circa 936 – 1013]. The book contains some information on vaginal speculum such as its material, list of the diseases which indicate its use, and the positions of the woman for its application.⁹ Al-Zahrawi gathered the surgical information presented by Hippocrates and by integrating it with his own experiences, he presented them in a realistic way in his work *At-Tasrif*.⁹ Unlike the text-only style of classic writers, drawings of surgical instruments were used for the first time in his work. Namely, he wrote the first textbook, including drawings of medical tools in the history of medicine. He drew tools such as scissors, syringes, scalpel, and vaginal speculum, while also mentioning the application of these tools.⁹

Andalusian surgeon Al-Zahrawi is the symbol of the high scientific level attained by Islamic medicine in Europe in the Middle Age. Since his contributions improved the level of surgery from a simple craft to a reputable field of medicine, he is accepted as the father of modern surgery. *At-Tasrif* is a thirty-volume medical encyclopedia and its chapters on surgery contain the above-mentioned drawings, while descriptions of many surgical procedures are particularly important.

Anatolian physician and surgeon of 15th century Şerefeddin Sabuncuoğlu [circa 1385 – 1470], was a prominent follower of Al-Zahrawi. In his book titled as “*Cerrahiyetü'l Haniyye (Imperial*

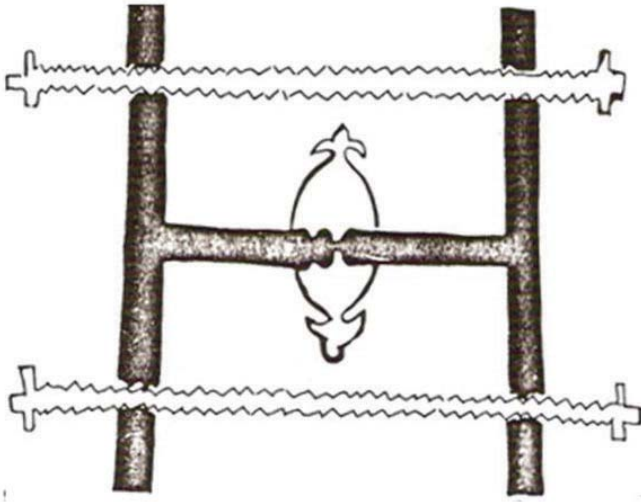


Figure 1. Speculum drawing from the 77th chapter of the book “*at Tasrif*” of Zahravi (Huntington copy).



Figure 2. Computer-aided design made by Akin Çömelekoğlu of the wooden vaginal speculum.

Surgery”, the explanation of medical instruments with drawings was used in a way similar to “*At Tasrif*”.⁷ Aside from presenting the drawings of medical instruments, Sabuncuoğlu provided miniatures depicting the practices conducted.⁷ Sabuncuoğlu is the first author of medicine who explained the medical procedures with drawings. In this context, *Cerrâhiyyet’ül-Hâniyye* is the first medical textbook depicting how the vaginal speculum is applied on patients.⁷

Due to oxidation of metal and decay of wood, most of the historical medical instruments do not exist anymore.^{2,3} For this reason, to gain information about the forms and clinical uses of historical instruments manufactured from such materials, the best approach is generally to choose the indirect way which is benefiting from old medical books.¹⁰ In this context, medical manuscripts containing instrumental drawings have a higher value.¹⁰

The configuration of *At-Tasrif* and *Cerrâhiyyet’ül-Hâniyye* are parallel, and their chapter numbers are same. In the 74th chapter of the books, both Al-Zahravi and Sabuncuoğlu mentioned diseases in which vaginal speculum is used. Moreover, in this chapter we can also see the illustration of the instrument drawn by Sabuncuoğlu.^{7,9} In the 77th chapter focusing on difficult deliveries, while Al-Zahravi’s book includes the drawing of the instrument (Figure 1), Sabuncuoğlu’s includes a miniature on how to use it (Figure 2).^{7,9} Among its numerous original features, *Cerrâhiyyet’ül-Hâniyye* is also special for being the only book demonstrating the use of wooden speculum. According to Sabuncuoğlu and Al-Zahravi, the speculum with leaves made from wood does not exist anymore.

There is an important difference regarding our topic between the genital examination miniatures in 77th chapters of two main copies of the Sabuncuoğlu’s book written and drawn by the author himself. Although the miniature in İstanbul (*Millet Kütüphanesi*) copy contains a vaginal speculum, the one in Paris (*Bibliothèque Nationale*) does not. Since the miniature of İstanbul copy is worn and blurred, we prefer not to present it, but to prepare a wooden vaginal speculum added to the version of the miniature of Paris copy.

By benefiting from the written and visual information on vaginal

speculum provided by the books of Al-Zahravi and Sabuncuoğlu, a wooden vaginal speculum was manufactured under the supervision of authors of this article. Computer-aided design of this tool was made pursuant to the original by mechanical engineer Akin Çömelekoğlu with the guidance of the authors (Figure 2).

In the 77th chapter of the book of Sabuncuoğlu titled “It describes the shapes of the tools used to remove the baby who died in the mother’s womb”, vaginal speculum is one of the medical tools mentioned.⁷ The section of the chapter used as a basis for the remanufacturing of this tool is given below:

“Let us explain and show the usage and the shape of speculum, which is mentioned in the 74th chapter. You have to manufacture this tool from the ebony tree or boxwood tree. It should be like the tool with which they cut the edges of books. But the width of this tool for each side should be two fingerbreadths; its thickness should be one fingerbreadth and its length should be one and a half hand span. And its augers must be four; two of which are twisted in the same side towards the same direction and the other two are twisted in the opposite side towards the opposite direction. Also, two pieces of board must be placed in the middle of the two main boards with augers. Their length should be half hand span and their width should be two fingers. The two pieces of board should be so compacted that they should look like just one single board. They must twist those four augers one by one until the tool gives way to open the vagina by diverging these two boards and inserting the tool into vagina during surgery, so that the surgeon would carry out the orders we state. Yet, patients must sit on a U-shaped seat during surgery”.

During the designing phase based on the text and the drawing mentioned above, the lengths given in terms of hand span and fingerbreadth were converted into the metric system. For this conversion, the hand of Çömelekoğlu was taken as a reference and all the measurements were applied based on his hand. Two long pieces, four augers and two leaves were formed in the 3D simulation program by a computer, giving the proper shape of the direction of movement to the screws that will enable them to open and close the leaves. As Sabuncuoğlu pointed out, the tool

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looks like a clamp used in bookbinding; however, the one with leaves is placed inside the vagina and used as a means of opening/loosening instead of tightening.

The order of the pieces that were carved one by one from boxwood is in accordance with the design in the computer environment. To function properly, the speculum was tested on a female genital model that is commonly used in teaching obstetrics. In this phase, we also benefit from the 74th chapter of Sabuncuoğlu's book which contains information regarding the use of vaginal speculum.⁷ This information is given below:

“Then, you shall tell the patient to sit on a U-shaped seat, flex both calves to her two thighs and pull both thighs to the abdomen. Then the midwife shall sit to the right side of the patient and insert the tool that will open the vagina, whose shape is like in the below and which was called by the physicians of the old palace as “*miftah-ul-ferc*” (vulva opener), till it reaches the cervix. If the tool is long, linens must be placed on both sides of the vagina so that the tool will not penetrate into it too much. Then, the tool's augers shall be twisted till vagina is opened and visible up to the cervix”.

For the speculum to be opened without being damaged and without slipping from its location, augers must be twisted one at a time. Therefore, the twisting movement of the augers should not be limited by the thighs of the woman under examination and the two assistants hold the tool should not hinder each other. Although *Sabuncuoğlu* gives the width and length of the leaves applied to the vagina, he provides no information about their thickness. By implementing the vaginal speculum on a female genital model, utilization of the augers was optimized and the ideal thickness of the leaves was determined. Moreover, in this phase, the lengths of the augers were determined based on the degree of required openness in situations where the speculum is applied.

In conclusion, drawings and illustrations as the supplements

of texts and speeches, provide a significant advantage in understanding the history of medicine in general, and the history of medical instruments in particular. Using original instruments or a properly reproduced 3D replica provides even more insight. Accordingly, in this study, we aimed to bring the past into today and present it as a physical and tangible entity by reproducing an extinct and historical version of a medical instrument still used in the field of gynecology and obstetrics. Conducting such studies will provide the basis for carrying out more accurate analyses to the historians of medicine, while also provoking and attracting the interest of the general public and the healthcare professionals to the history of medicine.

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