

## PRACTICAL TEACHING OF SURGERY IN THE EIGHTEENTH CENTURY : THE UNIVERSITY OF SALAMANCA'S MANNEQUIN

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With the opening of the Museum of the University of Salamanca last July, one can see a very singular piece in the history of Scientific Museology : The mannequin of the XVI century (Figure 1).

It is considered to be a proof of the special esteem and importance that surgery occupied in the Mediterranean countries, and particularly in the University of Salamanca, already in the Renaissance period. As a consequence of the Spanish war-conflicts in the XVI century, surgery could enter easily in the Spanish universities much earlier than in any other European university (italian universities were an exception). Also the tradition in practical surgery in Spain contributed to its acceptance.

The chair of Surgery in the University of Salamanca was created in 1566, answering social needs (lack of surgeons and their insufficient instruction). King Felipe II had been petitioned for it by the public authorities of Salamanca and came up with the request to the "Claustro" of the University. With an initial rejection, this new teaching was established as "cursatoria" (that is, with a secondary character and a shorter period for teaching) in 1567 and Andrés Alcázar was appointed first "catedrático" (full-professor) of Surgery of Salamanca.

The discipline was imparted along four years and the medical students had to follow and see how the surgeon practiced his healings in the "Hospital del Estudio" (Study Hospital), in the "Hospital General" (General Hospital) and in private houses. In the fourth year a subject, called "algebra", was studied and it consisted in the knowledge and treatment of the fractures and luxations. The Guy de Chauliac's treatise of surgery was used for the theoretical "lectiones" (Guy de Chauliac was named Guido de Cauliaco in Spain).

In 1568, and in order to practise the knowledge obtained in this last course, Andrés Alcázar requested the "Claustro of the University for the making of a pine-wood mannequin. The teacher could illustrate with it the different types of bandages, constraints and reductions of broken and dislocated bones. The wooden piece was made by the sculptor Mateo de Vangorla in 1570 and was appraised by Antonio de Arce for 27 spanish ducats.

As we can verify through the following images, it is a pine-wooden painted sculpture of 140 cm and it reveals the style and technics of the Castilian religious sculptures of the period in question. The glass eyes and the oral and anal holes contributes to its realism. However the great mobility of some parts of the mannequin is the main feature of its realism. All articulations were thought of to make sure that a heavy wooden ball turned around in the socket created in the above mentioned articulated parts. In order

to limit the rotational movement of this mechanism, wooden disks were located into the ball and some wooden pins prevented unreal displacements. This mechanism can be observed in neck, shoulders, elbows, wrists and left knee. Actually, the left foot and the left hip have a total rotational movement since a great pin serves as a rotational axis (however there are little holes which could have had pins that held in this entirely rotating). Right leg and trunk are made in a solid piece in order to allow a good support (Figure 2).

At the end of the sixteenth century, the fixing of the left knee and an pedestal of wood were made to increase the stability of the sculpture. An examination to obtain the chair of Surgery in 1602 may be used as a proof. After a lecture on one chapter of Guido's treatise, it was compulsory to practically demonstrate the using of bandages on the mannequin.

El dicho opositor leyo en el dicho claustor, y después de lo haver leydo hizo ciertas ligaduras en la estatua de palo que para ello se metió en el dicho claustro, y por quanto se havian de hacer algunas de la sdichals ligeduras en los pies y la estatua los tenia clavados en una tabla hizo algunas en la cabeza y brazos de la estatua, y las de los pies y piernas hizo en uno de los pies del doctor Ruiz (...) [5]

If we have dedicated such a long introduction to the teaching of pre-illustration surgery, it is mainly due to the fact that until the middle of the XVIII century, the teaching or surgery in the University of Salamanca followed the same pattern. The authority judgement made that Guido de Cauliaco's treatise (and the clear presence of Hypocrate, Galeno and Avicenas on it) was accepted as the obligatory text-book in the Chair of Surgery and the bandage practices were using the mannequin as an adequate support.

The conservative character of this training lead to a progressive worsening in the surgeons' formation. However, at the beginning of the eighteenth century, the pressure exerted by the Reales Colegios de Cirugia was the propelling force in such a necessary change. An examination of the Chair of Surgery which took place in 1765 gives us a good evidence of it : Andrés Martín Nieto, ("Cirujano Latino" and "Vachiller en Artes" by the Colegio de Cadiz), was one of the candidates for that examination. As soon as the summons of the examination was given, he insisted on the introduction of different practical exercises. His request was not taken into consideration and the examination was made following the previous classical way : with a lecture on Guido's and the ligatures on the head and the arm of the mannequin. The chair was granted to Tomás Sendin y Ulloa, and this fact gave rise to the protest of Nieto. [6]

This controversy had an additional interest since it took place one year before the new project for medical studies was proposed by the University of Salamanca. This program implied a total rupture with the traditional instruction. In Surgery, the Guido's treatise was displaced by the Gorter, Heister and Petit's Books, but the practices were kept up in an unchangeable way. For this reason the mannequin was restored by Master Gavilan in 1765, as it can still be seen in its lumbar zone (Figure 3). So, after this reform of the education, the surgical practice kept down to Renaissance parameters as it can be concluded from a report given by a inspection committee that visited the Chair of Surgery in 1777. This committee recommended the regular professor.

Que haga la correspondiente descripción de operaciones, vendajes, y demas adminiculos por heister, 6 Monsiur Petit un día cada semana en el esqueleto de la Libreria, á cuyo efecto compre los materiales necesarios, segun está mandado en las anteriores vistas, dando la cuenta para su abono, y colocandolos en la Libreria con el resguardo correspondiente, y que para ello se haga un arca pequeña[...] [7]

From the XVI century on, some urological practices could be found among all these surgical operations : for instance, a special operation, called "talla", which was very common at that time. Also it can be mentioned that the use of the so called "candelillas" for the dilatation of the urethral narrowness was a Spanish invention (due either to Alderete or to a so called "maese Felipe") and the Francisco Diaz's treatise revalued Urology as a surgical speciality. Therefore, it is not impossible to think that some unofficial and shallow knowledge about these urological operations was given to the students of surgery. This hypothesis could be also conformed by a meticulous inspection of the mannequin : the articulated penis, the anal orifice perforated in the figure and the large dimensions of the perineal region, so contrary to the realism that characterizes the rest of the sculpture, induce us to think that the mannequin was used also for urological practices (Figure 4).

At the end of the XVIII century, the use of the mannequin as support for surgical practice was left and came to be used for anatomical ones. After the reform of 1766, the "Consejo de Castilla" urged the University to build an Anatomical Theatre, its construction began in 1774 and was finished in 1780 [8]. Two years later, the mannequin was inventoried as a piece of the Chair of Anatomy : "Enmedio del teatro, hai en Esqueleto grande artificial para las demonstraciones, colocado demodo que se maneja para el lado que se quiere en figura recta" [9];

To sum up briefly, this beautiful carving expresses more than two centuries of practical teaching of surgery in the University of Salamanca. Every Professor, who occupied this Chair, had the bandages of the articulated members of the mannequin as a unique proof of his abilities. Two centuries of surgical history can be properly contemplated, thanks to the restoration that the University of Salamanca will make of this important museum piece.

#### **Aknowledgement**

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#### **RESUME**

Construit en 1570 sur commande de l'Université de Salamanque, date à laquelle Andrés Alcázar était Professeur Agrégé de Chirurgie, le mannequin dont il est question dans cette conférence fut utilisé dans l'enseignement jusqu'au début du XXe siècle. Il s'agit d'une statue en bois de pin polychrome de 140 cm de hauteur présentant clairement des affinités avec le style et les techniques de l'imagerie castillane de l'époque : les yeux de verre et la reproduction de la cavité orale et anale sont la preuve de son réalisme. Une boule en bois massif tournant à l'intérieur de la sphère creuse qu'offrent les parties

articulées (énartrose) le dote de mobilité au niveau du cou, des épaules, des coudes, des poignets et du genou gauche. Quelques tétons permettent de limiter ses mouvements aux possibilités réelles... A la fin du VI<sup>e</sup> siècle, on le fixa sur un socle en bois. Pour lui conférer de la stabilité, le genou gauche fut immobilisé. De même, le pénis (aujourd'hui disparu), lui aussi doté de mobilité, permettait au professeur d'expliquer les processus d'interventions urologiques. Néanmoins, jusque vers la fin du XVIII<sup>e</sup> siècle, sa principale fonction consistait à servir de support pour la réalisation des travaux pratiques de chirurgie traumatologique et de bandages en quatrième année d'études (dans la matière qui était connue comme algèbre). On l'utilisait également lors des concours à la Chaire de Chirurgie.

Il s'agit donc d'une importante pièce de musée, unique en son genre en Espagne. Elle a toujours suscité l'intérêt de l'Université de Salamanque, tel que nous le démontre sa restauration en 1765 ainsi que les nombreuses références retrouvées dans les "Libros de Claustro y de Contabilidad" des archives universitaires. Actuellement, le mannequin est conservé au Musée de l'Université.

## REFERENCES

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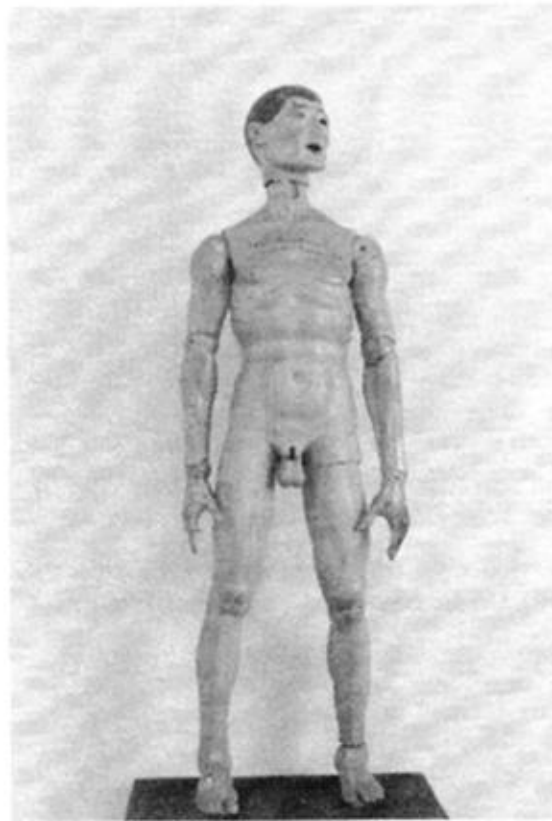
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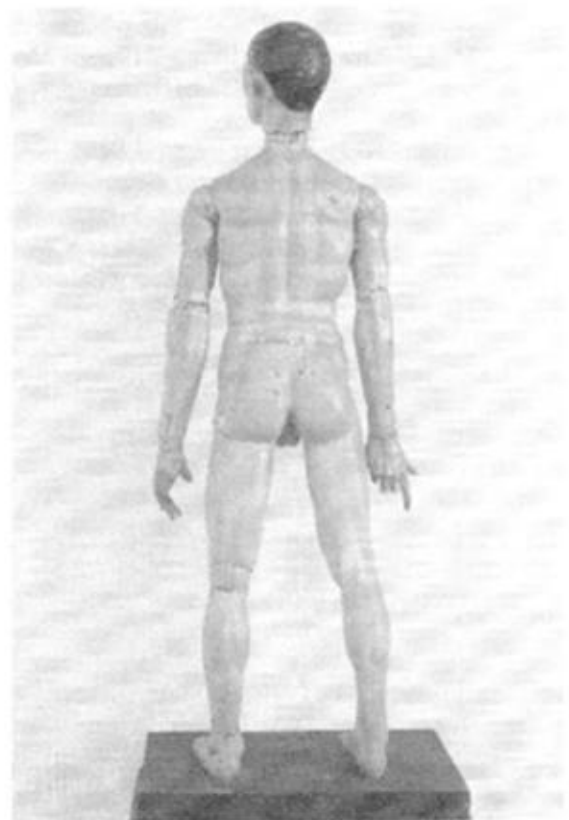
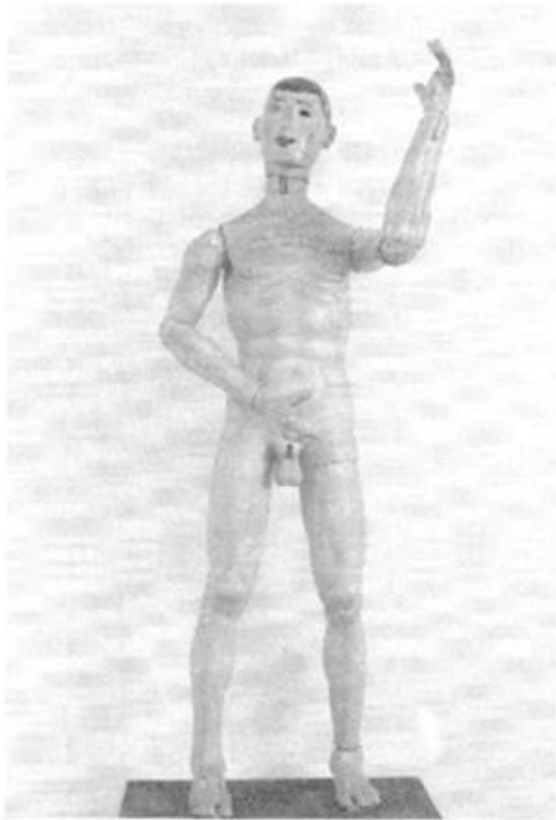
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**Fig. 1** : Front view of the mannequin of the XVIth century, it was designed for practice of "algebra" or traumatology. On the chest we can read *luffu Vniuersitatis factu anno 1570 Renovat-e 1765* (Museum of the University of Salamanca).



**Fig. 2 :** The enarthrosis system, very evident, in the left- elbow, gives a complete mobility to the mannequin. The displacements do not exceed the real possibilities thanks to wooden pins placed in the articulated parts.

**Fig. 3 :** Back view. Notice the articulation of the left knee and the wooden pins (very visible in both wrists). On the lumbar zone, it is possible to read *Arqut Gabilan Ejcul & Pinx anl.*



**Fig. 4 :** View of the perineal zone. The extent of this zone, the anal cavity and the articulated penis (as we can see in the previous figures) induce us to think of a use for urological practices.