

A Comparison of the Urinary System in the First Printed Modern Turkish Anatomy Book and Contemporary Anatomy Books

Basılan İlk Türkçe Anatomi Kitabı ile Modern Anatomi Kitaplarında Yer Alan Üriner Sistem Konularının Karşılaştırılması

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Objectives: In our study, we examined the urinary system explained in the first printed Turkish anatomy book "Miratü'l Ebdan fi Teşrih-i Azaü'l İnsan", and the urinary system existing in the contemporary anatomy reference books. With the results of our study, we aimed to provide a reference on the development of Turkish medicine and anatomic history for today's anatomists.

Study Design: Urinary system explanations of Şanizade's work were translated into today's Turkish. The information on urinary system included in Miratü'l Ebdan fi Teşrih-i Azaü'l İnsan was compared with the information on the same topic existing in today's modern anatomy reference books.

Results: Miratü'l Ebdan fi Teşrih-i Azaü'l İnsan consists of several parts on urinary system, which are kidney, capsulitis and vesica urinaria. The information about ureter is given under the part on kidney. Initially, positions of the organs, and then the physiognomy and internal structures are covered. Notably, we determined that the internal structure of kidney and the vein system is expressed in detail.

Conclusion: Şanizade used Ottoman Turkish terminology when he translated the original foreign source. He expressed the knowledge of his time in the best way. There are numerous points that correspond to contemporary knowledge on urinary system.

Key words: Anatomy; urinary system; kidney; vesica urinaria; Ottoman book.

Amaç: Çalışmamızda basılmış ilk Türkçe (Osmanlıca) anatomi kitabı olan Miratü'l Ebdan fi Teşrih-i Azaü'l İnsan'da açıklanan üriner sistem ile modern anatomi kitaplarında açıklanan üriner sistemi inceledik. Amacımız çalışmamızın sonuçları ile günümüz anatomistlerine Türk tıp ve anatomi tarihinin gelişimi üzerine bir kaynak sağlamaktır.

Çalışma Planı: Şanizade'nin çalışmasındaki üriner sisteme ilişkin açıklamalar günümüz Türkçesine tercüme edildi. Miratü'l Ebdan fi Teşrih-i Azaü'l İnsan'da yer alan üriner sisteme ilişkin bilgiler, aynı konuda günümüz modern anatomi kaynak kitaplarında yer alan bilgiler ile mukayese edildi.

Bulgular: Miratü'l Ebdan fi Teşrih-i Azaü'l İnsan üriner sistem üzerine böbrek, kapsül ve mesane olmak üzere çeşitli bölümler içermektedir. Üretere ilişkin bilgiler böbrek bölümünde verilmiştir. İlk olarak organların yerleri, daha sonra organların görünümü ve iç yapıları açıklanmıştır. Böbreğin iç yapısının ve damar sisteminin detaylı olarak açıklanmış olması tarafımızdan dikkat çekici bulunmuştur.

Sonuç: Şanizade orjinal yabancı kaynağı tercüme ederken Osmanlı Türkçesi terimlerini kullanmıştır. Zamanının bilgisini en iyi şekilde ifade etmiştir. Üriner sistem üzerine pek çok noktada modern bilgi ile uyumludur.

Anahtar sözcükler: Anatomi; üriner sistem; böbrek; mesane; Osmanlıca kitap.

Şanizade Mehmet Ataullah (1771-1826) is a scientist who has studies on medicine, mathematics, literature and history. He struggled to raise the level of Turkish medicine to the most contemporary medicine level of his time (Fig. 1).

He made the first proposal for establishing a small-pox vaccination center in Istanbul. Since he knew several foreign languages, he translated some foreign medicine books into Ottoman-Turkish and prepared a glossary of Ottoman-Latin medical terms. Medical and some technical terms entered Turkish terminology with his works. He wrote a book named "Miratü'l Ebdan fi Teşrih-i Azaü'l İnsan" (from now on it is called as "the book"), collecting the anatomic information existing in the western medicine books. This translation work is the first printed modern illustrative anatomy book in Turkish and is the first book of "Hamse-i Şanizade" (also known as "Kanun-i Şanizade"), a combined printing of five books, which are "Miratü'l Ebdan fi Teşrih-i Azaü'l İnsan", "Usülü't Tabia", "Miyarü'l-Etibba", Kanunü'l Cerrahin", "Mizarü'l Edviye". The first three books were printed as a single volume in Istanbul in 1820. Miratü'l Ebdan fi Teşrih-i Azaü'l İnsan also presented to Sultan Mahmut II by Sadrazam (Grand Vizier) Mehmet Emin Rauf Pasha for his appreciation.^[1-8]

In this study, we studied the urinary system explained in the first printed Turkish anatomy book "Miratü'l Ebdan fi Teşrih-i Azaü'l İnsan", and the urinary system existing in the contemporary anatomy sources. We aimed with the results of our study to establish a source mentioning the development in Turkish medicine and anatomic history for today's anatomists.

MATERIALS AND METHODS

Urinary system topic of the book was translated into today's Turkish. The information contained on urinary system was compared with the information existing in today's modern anatomy books on this topic. The similarities and differences were identified. English and Latin meanings of the Ottoman terms were found.



Fig. 1. Şanizade Mehmet Ataullah (1771-1826).^[2]

RESULTS

In the book, the urinary system is expressed under the headings "kilye" (ren, kidney), "muhafazat-el-sevda" (paranephrium), "mesane" (vesica urinaria; urinary bladder). The ureter is expressed under kidney topic (Fig. 2).

Initially, positions of the organs, and then the external and internal structures are covered. It is notable that internal structure of kidney and the artery system is expressed in detail. We presented the comparison of urinary system terminology in Table 1.

In the book, the kidneys are at the sides of and behind the abdomen. They are in pairs and covered by membrane. The one on the right is under liver; the one on left is under spleen. Şanizade expressed the kidney in three parts as "cevher-i kışriye, muhafazat el-sevda" (membrane), "cevher-i kasabiniye" (hole), "cevher-i halemiye" (breast).^[9]

The arteries called as "şiryan-i kilyevi" (a. renales) comes through the aorta. These tin and long arteries are separated into 4-5 branches



Fig. 2. The page in which urinary system is stated in *Miratü'l Ebdan fi Teşrih-i Azavü'l-İnsan*.^[9]

which are called as “şube-i kebiriyeye”. These branches are also separated into branches that form an arc, and go in through the kidney.

He called the kidney pyramids (pyramides renales) as “Halme”. There are twelve pyramids. These pyramids form the inner structure of the kidney. Each pyramid has a base and a vertex. The vertexes of those pyramids meet at the hole or lacuna of the kidney. This hole is a thumb's width and funnel- or cone-shaped. It is named as “Havzat el-kilye” (pelvis renalis, kid-

ney pelvis). The urine drained in the kidney is collected in this hole. The urine tubes named as “Halib” goes out from this hole. These tubes go down through behind vesica urinaria and go in through the wall and reaching the gap of vesica urinaria.

Şanizade discusses vesica urinaria as a separate unique topic. Beginning with the placement of the organ, it is located under the abdomen, between the belly and the pelvis. Since ureters are outside of the peritoneum, vesica urinaria is outside of the membrane. In men's body it is located in front of the rectum and in women's body it is located between the uterus and the inguinal region.^[9]

As for the structure of vesica urinaria, there are three holes; one of them belongs to urethra, two of them belongs to ureter. It has a three-layer wall. The first layer is peritoneum covering the bottom of vesica urinaria. The second layer is composed of muscles and the third layer is composed of nerves. Inner surface of the third layer is velvet-like, hairy and wrinkled. As it is filled with urine, wrinkles disappear and the surface becomes smooth.^[9]

DISCUSSION

Even the placement of the kidneys in the book is described very simple comparing with today's descriptions existing in anatomy sources; this simple description is not out of the reality. In fact, the expression “behind the abdomen”

Table 1. Comparison of the terminology related to urinary system

Miratü'l Ebdan fi Teşrih-i Azavü'l-İnsan	Contemporary sources
kilye, böbrek	ren, nephros, kidney
cevher-i kışriye, muhafazat el-sevda	paranephrium (capsula adiposa, fascia renalis, gl.suprarenalis, aa.renales)
cevher-i kasabâniye	pelvis renalis; renal pelvis
cevher-i halemiye	medulla renalis; renal medulla
şiryân-ı kilyevi	aa.renales; renal artery
şube-i kebiriyeye	aa.segmentales; segmental artery
halme	pyramides renales; renal pyramids
havzat el-kilye	pelvis renalis; renal pelvis
halib	ureter
mesâne	vesica urinaria; urinary bladder

expresses the retroperitoneal position of the kidneys. There is no information about the neighboring organs except the liver on the right and the spleen on the left side.^[9-13]

Şanizade divides the kidney into three parts. Considering “cevher-i kişriye”, it corresponds with paranephrium (capsula adiposa, fascia renalis, gl. suprarenalis, and vessels). Similarly, “cevher-i kasabiniye” corresponds with pelvis renalis, cevher-i halemiye corresponds with medulla renalis.^[9,11,12] It can be concluded that the concepts of cortex renalis and sinus renalis did not exist for the moment. There is no thorough information about the physiognomy and neighborhood (surfaces, edges etc.) of the kidney. He describes the sheaths covering the kidney as a single membrane structure. Among these sheaths, capsula fibrosa could not be distinguished for the moment. Additionally, capsula adiposa and fascia renalis are considered as the same single layer.

The artery originating from the aorta separates into 4-5 branches and each of those branches reaches the kidney. This explanation probably points out a. renalis together with its branches named as a. segmentalis for today. This information significantly corresponds with today’s knowledge. On the other hand, it is understood that he did not have any information about the segmental structure of the kidney.^[9-13] When we consider the explanation of “branches forming an arc”, we understand the aa. arcuatae.^[10] He defines pelvis renalis and he explains that the ureters originate from pelvis renalis. There is no information about calices renales. The pyramids renales and the number of them are given correctly as they are known today.^[9,11-13]

He explains the ureters under kidney topic and he does not mention them as a separate organ. They are placed on the back wall of the abdomen and out of peritoneum, and from there they go down through vesica urinaria. Since there is no information about their parts, neighboring existences, and their narrowness, the explanations about ureters are distinguished from the explanations existing in today’s anatomy books.^[9,11-13]

Vesica urinaria is considered as a single topic. The information about its location and neighboring existences corresponds with today’s knowledge. No information about the parts of the organ (apex vesicae, fundus vesicae, cervix vesicae, facies superior, facies inferolateralis) is given. It is distinguished from today’s knowledge regarding the four-part structure of vesica urinaria (tunica mucosa, tela submucosa, tunica muscularis, tunica serosa) since it is described as a three-part structure. Even though the peritoneum (serosa) and muscle layers correspond with today’s explanation, we conclude that the nerve layer is actually mucosa layer. The three holes, one belonging to urethra (ostium urethrae internum) and two belonging to ureters (ostium ureteris), are explained correctly.^[9,11-13]

The anatomy book “Miratü’l Ebdan fi Teşrih-i Azaü’l İnsan” is a translation work. The author used Ottoman terminology. The information in the book is composed of up-to-date details of his time. There are numerous points that are consistent with today’s knowledge on the urinary system. As it is the first printed Turkish anatomy book, it is certain that it will always retain its outstanding value.

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