

Urological and genital surgery in ancient Egypt

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Competing interests

The author declares no conflicts of interest.

Acknowledgments

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Citation

Blomstedt P. Urological and genital surgery in ancient Egypt. *Hist Philos Med.* 2023;5(1):4. doi: 10.53388/HPM2023004.

Executive editor: Na Liu.

Received: 25 October 2022; Accepted: 06 December 2022;

Available online: 20 December 2022.

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Abstract

Background: Ancient Egypt might be considered the cradle of medicine. The modern literature is somewhat too enthusiastic regarding the procedures given an Egyptian origin. The aim of the current paper is to briefly analyze the claims regarding urological and genital surgery in Egypt, in order to decide what the Egyptian actually do, and what has incorrectly been ascribed to them. **Methods:** The original sources as well as the modern literature was reviewed regarding surgery in ancient Egypt. **Results:** There is only one source indicating a urological procedure for medical indications in the Egyptian material. The Ebers papyrus can be interpreted as describing a surgical treatment for hydrocele. The sources are more abundant regarding male circumcision, while female circumcision is mainly documented from a later period. The suggestions that castration and lithotomy were performed are based on a lack of understanding of the sources. **Conclusion:** The ancient Egyptians did possibly treat hydrocele with a minor surgical procedure, but there are no indications in the sources that other urological procedures were performed. Circumcisions were common, but were not performed on a medical indication. These findings are in line with the general level of Egyptian surgery.

Keywords: Egypt; urology; circumcision; castration; history

Introduction

Egypt may be considered the oldest of the early advanced civilizations. Already at the time of the merging of the Upper and Lower Kingdoms around 3200 BC, an advanced society had developed and the birth of the Old Kingdom around 2686 BC initiated an era that would be characterized by significant achievements in many fields, such as art, architecture, social engineering, and medicine, as seen from contemporary sources [1-3].

The art of medicine was one of the areas that might be said to have first seen the light of day in Egypt. Pliny the elder tells us that this was at least the opinion of the Egyptians themselves [4].

However, even if Egypt might be considered as the cradle of medicine, the modern literature is sometimes too enthusiastic. Such procedures as cataract surgery [5, 6], trephinations [7, 8], tracheostomies [9, 10], dental surgery [11, 12], etc have often, but incorrectly, been considered of Egyptian origin.

This has created a fog through which it is difficult to discern the true surgical achievements of the Egyptians. In an attempt to provide a critical and balanced image of the surgical skills of the ancient Egyptians a review of the original sources as well as the modern literature regarding the different areas of surgery was necessary.

The aim of the current paper is to briefly present and analyze the primary sources, as well as the modern scientific and scholar literature concerning urology and genital procedures in ancient Egypt. It might be argued that the genital procedures performed in Egypt had little to do with surgery, but since genital procedures are normally included in works on Egyptian surgery, and in order to provide a comprehensive analysis I have also included these procedures.

Surgery in ancient Egypt

The existence of different specialties within the field of medicine is well known from ancient Egypt, such as what we today would refer to as ophthalmology or dentistry. Contrary to what has sometimes been stated [13], there are, however, no indications that surgery was one of these, or seen as separated from the field of medicine in general [14, 15], and the same is of course true regarding urology.

Our main sources of knowledge regarding surgery in Egypt are the preserved medical papyri, mainly the Edwin Smith papyrus [16]. The 48 case presentations in this remarkable document are arranged in a systematic manner beginning with the skull and progressing downwards. For some unknown reason the scribe has stopped in the middle of the text, in the middle of a case, in the middle of a word. It seems natural that the original manuscript would have continued all the way down to the feet, but unfortunately we have no case involving the pelvic area (or the lower extremities). We are more fortunate concerning the other great medical papyrus, the Ebers papyrus.

Hydrocele

The Ebers papyrus is a compilation assembled from several different sources dated to around 1534 BC, even if parts of it may be older [13]. The last part of the papyrus is treating surgical conditions, mainly minor procedures for superficial tumors, but one case is of certain interest here:

“Instructions concerning an oozing swelling of the male genitals: If thou examinest an oozing swelling of the male genitals, that has made the swelling on his belly, and if thy finger examines, and it is like hp' under thy fingers and it slips away, then thou shalt say concerning it: it is a swelling of the male genitals; it is a disease which I will treat by an operation. Thou shalt bandage him with grease and treat as one treats wounds in any limb of a man.”

(Translation Ebbell [13])

It has been suggested that we are here dealing with a case of hydrocele [13]. This interpretation seems at least possible, even if it can hardly be considered as beyond doubts. Unfortunately, no details are provided regarding the operation, but we might assume that it was a case of simple punctuation and drainage of the fluid, in accordance with the procedures described for abscesses elsewhere. To assume a

more advanced procedure, as known from later in Antiquity [17], would not be in accordance with the general level of surgery in Egypt.

Male circumcision

According to Herodotus circumcision first originated in Egypt, or possibly in Ethiopia:

“the Colchians, Egyptians, and Ethiopians alone of all the races of men have practised circumcision from the first. The Phenicians and the Syrians who dwell in Palestine confess themselves that they have learnt it from the Egyptians, and the Syrians about the river Thermodon and the river Parthenos, and the Macronians, who are their neighbours, say that they have learnt it lately from the Colchians. These are the only races of men who practise circumcision, and these evidently practise it in the same manner as the Egyptians. Of the Egyptians themselves however and the Ethiopians, I am not able to say which learnt from the other, for undoubtedly it is a most ancient custom”

(Herodotus, Book 1 [18])

The Egyptian origin of this practice has also often been stated in the modern literature [19, 20], or at least that Egypt was one of the first places where it originated [21-23]. In reality circumcision seems to have evolved independently in many different cultures and while we cannot know where it first originated we can at least agree that the oldest evidence for this procedure is of Egyptian origin [24].

Male circumcision in ancient Egypt is well known and has been extensively analyzed in many works. We will here focus on the surgical details, but this procedure should of course be considered more of a religious rite than as a surgical procedure [25]. The reader interested in a more general analysis is advised to consult the excellent work of Jonckheere *“La circoncision des anciens Egyptiens”* [24].

Besides Herodotus, this procedure is also mentioned in other works from the Greco-Roman era, such as the works of Diodorus Siculus [26], Strabo [27], Philon of Alexandria [28], and Ambrosius [29]. These sources provide little information of interest besides the existence of the procedure [2, 30, 31]. These authors do further belong to a much later period when circumcision was also used as a therapeutic operation, and even operations for cosmetic restoration of the foreskin are known from the 2nd century BC [17, 32-34].

If we turn to the few contemporary Egyptian texts that are more or less likely/clearly referring to circumcision, the provided information is meagre and often difficult to interpret for the non-Egyptologist [24, 35]. The oldest of these texts, and not surprisingly also the most ambiguous, is a pyramid text from the pyramid of Teti from the 6th dynasty [24, 36]. It is mentioned on a stele from Naga-ed-dêr from the 1st intermediate period [37]. Three inscriptions from Dendera from the 1st intermediate period have been suggested to refer to persons circumcising others, directly or by sponsoring the acts [38-40]. Another possible mentioning is the inscription from the tomb of Chnoumhetep II in Beni-Hassan from the 12th dynasty [24, 41, 42]. Roth has identified the word *“circumcised”* in the coffin text spell 397, however referring to a boat [39, 43]. It is further likely mentioned in papyrus Ebers (no 732), in relation to a receipt for hemorrhage [44], and possibly a line in *the Book of the dead* is referring to the self-circumcision of Ra [45, 46]. The Berlin leather roll with the inscription from the time of Sesostris I (12th dynasty) has been said to contain a reference to circumcision [42, 47, 48], even if this is not undisputed [49-51]. A similar meaning is found on a Stele in Florence from the same period [47, 48, 52]. Further an ostrakon from Ramasseum from the 19th dynasty might be referring to this procedure [24, 53], as well as a stela of Piankhi from the 25th dynasty [54]. These texts confirm the existence of the procedure, but tell us nothing more of interest.

Concerning depictions in two or three dimensions, the number of these where the penis can be studied in detail are limited, but some clear examples of circumcision are known [24, 55]. One of the most explicit being the statue of Snefrou-nefer from Giza from the Old Kingdom [56]. More important are the two two-dimensional circumcision scenes.

The circumcision scene from the tomb of Ank-ma-Hor in Saqqara belongs to the time of the first king of the 6th dynasty, Teti [57]. The

circumcision scene is located in the doorway to chamber V, whereas the other scenes discussed below are located in the actual chamber [39]. The scene (Figure 1) is actually composed of two scenes. It has sometimes been interpreted as two different males being circumcised [20, 22, 57], but most often as the same procedure presented at two different stages. The accompanying text can be interpreted as either the Hem-Ka priest is circumcising, or is being circumcised [24, 39, 58]. A “festival for the circumcising” is also mentioned in a text related to another of the scenes [39].

In the left scene the operator is in a sitting position, holding the “patient’s” penis with his left hand, while holding an oval instrument (probably a stone knife) against the dorsal aspect of the penis with his right hand. The “patient” is standing, and is being supported by an assistant, embracing him from behind and holding his arms secured and away from the area of the operation. The translation of the text in this and the other dialog has varied concerning the details, but the translation of Nunn is rather representative, and the variations are of limited importance to our present topic. The operator is saying to the assistant: “Hold him fast! Do not let him fall!”, while the assistant is responding: “I shall act for your praise” [58].

In the right scene the operator is in the same position and holding the penis with his left hand. He is here holding another instrument in his right hand, which seems to be another knife, with a pronounced handle. Roth has pointed out that the point of this knife is actually not depicted as being in the same position as in the left scene, but on the side of the penis opposite to the viewer. There is no assistant present, and the “patient” is portrayed in a rather relaxed position, standing with his right hand on his thigh and with the right resting on the head of the operator. The patient is saying: “Rub [it] well. In order that [it] may be effective”, while the operator is answering: “[I] will make it comfortable/well/pleasant/sweet”.

The temporal order between these scenes has often been interpreted as the right being a preparation before the actual circumcision in the left. This is especially the case when the right scene is (without much support) interpreted as depicting the use of a local anesthetic [24, 52, 59] (even though Badawy has the completely reversed order). The same temporal interpretation is suggested by Roth. She connects the right scene to the other grooming scenes (Figure 1, superior aspect, and Figure 2), and suggests that this is a case of shaving to achieve ritualistic purity. This interpretation is appealing when consideration is taken to the dialog, the relaxed position of the “patient” and the position of the blade at the side of the penis with the edge facing the patient. Roth has further pointed to the similarities between the right scene and a pubic shaving in the tomb of Nianchnum und Chnumhotep (Figure 3) [60]. Pillet has, however, suggested the right scene to represent the circumcision, and the left scene to represent the application of a healing ointment (so painful to the patient that an assistant has to hold him), after the circumcision. In order to make this plausible, he has, however, to hypothesize that the inscriptions have been inverted between the two scenes, which seems rather too complicated to be convincing [61].

These scenes have most often been discussed separated from the other scenes in chamber VI, but the suggestion that they should be seen as an entity, where the other scenes represent ritualistic grooming (massage, pedicure, manicure) in connection with the circumcision is appealing [39, 62]. These other scenes have sometimes been interpreted as depicting operations of hand and foot and the opening of a boil in the neck and on the knee (Figure 2) [20, 57]. This is difficult to reconcile with the depictions themselves, which displays far more similarity with other grooming scenes, such as those in the tomb of Nianchnum und Chnumhotep (Figure 3) and in the closely located mastaba of Khentika [63].

The other circumcision scene is of a more straight forward nature. It is located in the precinct of Mut in Karnak and belongs to the 18th dynasty (Figure 4). Unfortunately most of the upper aspect of this scene has been lost. What is left demonstrates the kneeling “operator” with the “patient”, a boy considerably younger than in the tomb of ank-ma-Hor (even if for artistic reasons of representation it is impossible to decide how young [61]), standing in front of him. In his

left hand he is holding an elongated tool, distinctly different from the knife depicted in the tomb of Ank-ma-Hor, while supporting the boy’s penis with his left hand. The tip of the knife is pointing towards the dorsal aspect of the penis. The boy is being held by an assisting female, perhaps the boy’s mother, while another presumed patient is waiting behind him, and another woman sits further back, in a position suggesting that she is ready to assist if needed [64]. Some other persons are also present in this scene, but they seem to be of minor importance to the procedure [61].

It is difficult to know how common this procedure was. It has sometimes been claimed to have been more or less universally adopted among the population, but this seems to be based mostly on written sources referring to the situation during Hellenistic times and later [31, 65, 66], while others have considered it to be a procedure reserved for the priestly cast [30, 48]. The texts and depictions do not allow us to conclude more than that the procedure was common, at least during later times [35], and they tell us little about variations over time or between different groups in society. The only material that might answer these questions is the mummy material, keeping well in mind the uneven distribution of this over time and between social strata.



Figure 1 The circumcision scene in the tomb of Ank-ma-Hor. Adapted from Roth 1991.



Figure 2 Treatment of hands and feet in the tomb of Ank-ma-Hor. Adapted from Roth 1991.

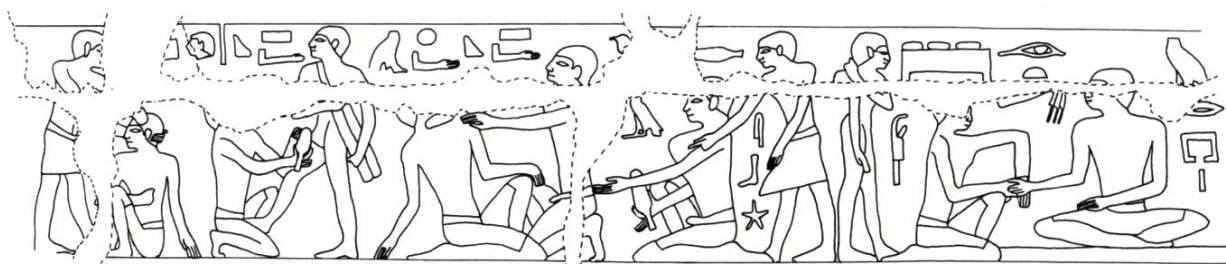


Figure 3 Shaving and manicure in the tomb of Nianchchnum und Chnumhotep. From Roth 1991.



Figure 4 Circumcision scene in the precinct of Mut in Karnak. From Sudhoff 1909 [2].

Concerning the mummies, the preservation of the penis is of course often so poor that even if it can be identified at all, it is not possible to decide on minor procedures of the prepuce. Many cases with well-preserved penises do however exist. Aufderheide reported a preservation rate of 71% regarding the external male genitalia in a pre-ceramic group of mummies from Chile [67], but this aspect of the Egyptian mummy material has not been systematically analyzed [59]. However, circumcised mummies are common [68, 69] and Smith claimed that all adult male mummies that he investigated, and where this could be decided, were circumcised [70]. Smith has, however, in the words of Cameron, commented on the difficulties adherent to this area of study: “the external genitals of mummies often exhibit most fantastic shapes, a contingency which frequently prevents one from coming to any definite conclusion with regard to the condition of these organs during life” [71]. It is further evident that boys were not circumcised before reaching puberty, or at least no such cases have been reported [24].

Concerning the technique this has seldom been discussed, but it seems as if most authors have not put in question that we are here dealing with a peritomi, that is a removal of the foreskin. However, Jonckheere [24] has suggested that the Egyptians used a more simple form, consisting in a linear incision in the dorsal part of the foreskin, leading to a retraction of the foreskin and uncovering the glans. As support for this hypothesis he has presented some depictions, of which the statue of Snefrou-nefer is the most convincing (A high resolution image is available online: <http://www.gizapyramids.org/media/view/People/858/8903?t:state:flow=c1e275e0-b16c-4fa2-b570-592b2eca1bd8>). He has also drawn the attention towards the circumcision scenes, where the circumciser has the knife in a position suggesting that he is about to perform a dorsal linear incision. Thirdly, he claim some support from Strabo, who writes concerning the Troglodytes:

“They deprive themselves of the prepuce, but some are circumcised like Egyptians”

(Book XVI, Chapter IV, § 17 [27])

He further seeks support regarding some lines in Diodorus Siculus concerning circumcision among the Troglodytes [24], but this is based on his own translation, which differs from other translations [26, 72].

Against Jonckheere one might object that it is only a few of the depicted circumcised penises that are clearly supporting a linear incision, and that it is difficult to imagine that the circumcision scenes would have been depicted in another manner by the artist, at the

moment before initiating the procedure, had the “operator” intended a peritomi. Pillet has further remarked, that a known variant of the circumcision includes first making a linear incision, and then incisions to the right and left in order to remove the prepuce [61]. The Greek sources are further of late date and we do not know if, or how, the fashion for circumcision might have varied over the millennia, and it is even possible that different techniques might have existed in parallel, as the case is concerning female circumcision in modern Egypt.

Concerning the circumcisers we have no clear information from the Pharaonic era, but during later times they appear to belong to the priestly cast [24]. The scene in Ank-ma-Hor might be interpreted as identifying the circumciser with a Hem-ka priest, as discussed above. The religious character of the procedure seems to support further such an assumption. There is at least nothing in the sources connecting this procedure with the doctors.

Female circumcision

Female circumcision is well known from modern Egypt, where it is still being performed [73]. Today, several different forms exist, and the transitions between them are not always distinct. The mildest form, which as an isolated procedure is quite rare, is the equivalent of the male circumcision, with removal of the clitoride prepuce. More commonly this procedure is combined with clitoridectomy, and in more advanced procedures the inner labia are also removed. In the most severe form, so called “Pharaonic circumcision” all parts of the external genitalia are removed, and only a small orifice preserved [74, 75].

In the medical literature it is often said that this practice originated in Ancient Egypt, sometimes specified as the Pharaonic era [76-82]. It has further been claimed that mummy-studies have confirmed that female circumcision was common [82], or at least that circumcised female mummies have been found [83, 84].

We have, however, no clear evidence suggesting female circumcision from pharaonic times. The only suggestion of this procedure is a magic inscription on the coffin of Sat-hedj-hotep from the Middle Kingdom where a substance from an “*uncircumcised virgin*” is mentioned [85-87]. The procedure is, however, mentioned in later Greek and Roman sources.

The first clear mentioning of female circumcision is found in a papyrus in Greek from 163 BC. referring to an individual case [2, 59, 88], however, without providing any details of the procedure. The same is true regarding Strabo [27] in the 1st century BC, Philon of Alexandria [28] in the 1st century AD and Ambrosius [29] in the 4th century AD. These do, however, inform us that this was the common practice of the Egyptians and that it was performed about the age of 14, or upon entering womanhood. Later, Aetios of Amida in the 6th century AD describes the use of clitoridectomy in Egypt in females of this age, but he attributes the practice to a sub-group of females with enlarged clitoris [87]. Paul of Aeginea is sometimes mentioned in relation to this practice, and it is correct that he provides a description of clitoridectomy [89], however, not in relation to Egypt [90].

There are no depictions of female circumcisions, even if it has been pointed out that the sex of the second “patient” in the circumcision scene in the temple of Mut in Karnak cannot be decided [87]. Concerning the mummies the result was normally not as good in

females as in males concerning the external genitalia. However, female mummies with well-preserved external genitalia exist, and in none of these have any signs of circumcision been found. It should be pointed out that a minor procedure, like removing the clitoride prepuce is unlikely to be identifiable [67, 91].

The sources thus confirm the existence of this procedure during the Greco-Roman era, suggesting it to be a common practice, and the existence of the procedure during earlier times is suggested from the inscription from the Middle Kingdom. We do however have no means of deciding which form of female circumcision that was performed in Egypt, neither can we decide how common this practice might have been during the various epochs. We can only conclude from the mummy material that more severe forms of this procedure were not the rule. As for male circumcision, this procedure has little to do with surgery, and it seems unlikely that the procedure was performed by doctors, at least during pharaonic times. One would rather expect such a procedure to be the prerogative of the religious casts, as was suggested regarding male circumcision, or perhaps even more likely of “wise women” as has been the rule during more modern times.

Castration

It has sometimes been claimed that the Egyptians performed castration during the pharaonic era [20, 92]. The most important source behind this is Diodorus Siculus from the 1st century BC. He mentions castration as a punishment and refers to a now lost depiction in the mortuary temple of Ramses II with captives of war “without hands and privy members” [26, 93]. Based on similar surviving scenes, such as those in the nearby temple of Ramses III (Figure 5), it is, however, evident that these procedures were performed on dead enemies as a way of counting bodies [94]. This is supported by the associated inscriptions [42, 95]. While cutting of hands seem to have been the normal way of counting fallen enemies, the Libyans are here represented by their phalluses, presumably in order to distinguish these uncircumcised troops from the others [94]. This is supported by the inscriptions, counting the number of hands and penises with prepuces [42]. The text of Merenptha in Karnak does also mention the collection of phalluses with prepuce from fallen enemies/Libyans [42, 93].

We have yet a mentioning of Pharaoh Ammanemes of the 12th dynasty being murdered by his eunuchs. The source of this is the *Aegyptica, a history of Egypt in Greek*, written by the Egyptian priest Manetho in the late 3rd century BC [96, 97]. This work has been lost, but fragments have been preserved in other works from the 4th century AD and later [98]. Considering that Manetho wrote his history more than one and a half millennia after the 12th dynasty, not too much trust should be put in his statement.

There are no depictions showing castrated males, but Jonckheere has suggested some cases of possible characteristic secondary changes induced by the procedure [93]. These cases are hardly convincing considering other possible conditions, especially of an endocrinological nature.

Regarding the mummy material, the mummy of Pharaoh Meneptah (19th dynasty), the son of Ramses II, was found with the scrotum removed. This has been suggested to be the result of a surgical procedure [99]. It was evident from the fresh wound that this was done shortly before death, or more likely after death, but before the embalming procedure was completed, since the wound edges were smeared with balsam [100]. The most simple explanation is of course that the scrotum was (inadvertently) avulsed during the mummification.

The mummy of Nekht-Ankh was also found with the penis avulsed and has like ways been suggested as a possible case of castration [101], however, without any compelling evidence or much support. The penis of Nekht-Ankh is further of interest since it displayed features leading Cameron to suggest this to be a case of subincision (Figure 6) [71]. There are, however, no other indications that this strange procedure should have been performed in Egypt [102], and considering the associated abnormalities of the skeleton and genitalia of Nekht-Ank, a congenital defect seems far more likely [90].



Figure 5 Counting of hands and phalluses in Medinet Habu. From Breasted 1932 [1].



Figure 6 The avulsed penis of Nekht-Ankh with what has been suggested as signs of subincision. Adapted from Murray 1910.

Lithotomy

Urinary stone seem to have been very rare in ancient Egypt, to judge from the few cases identified [103]. It has been suggested that lithotomies were performed by the ancient Egyptians, not only by cutting of the stone, but also by urethral dilatation with extraction [92, 104-109], and the latter procedure is sometimes described in surprising detail. This is unfortunately a pure myth which has been propagated through the scientific literature. There is nothing in the original sources which is even remotely connected to the cutting of the stone or urethral dilatation with extraction. It seems as if this myth has been caused by a careless reading of Willis book “*On the treatment of stone in the bladder*” from 1842 [110]. He is indeed mentioning these details in relation to Egypt, but he is referring to more modern times, or more exactly to the observations made by Prospero Alpini during his voyage in Egypt in the 1580ies, and published in his *Medicina Egyptiorum* from 1591 [111].

We might, however, mention here Ammonius Lithotomos, who belonged to a much later period and flourished in the Hellenistic culture of Alexandria in the 3rd century BC. According to Celsus he invented a method for the division of stones too large to be extracted directly via an incision [17].

Considering the level of Egyptian surgery in general it would be surprising if they had performed lithotomies, since only procedures of a very simple nature are documented in the medical papyri. Further, not a single surgical incision has been found in any of the tens of thousands investigated mummies from the Pharaonic period.

Conclusion

The development of surgery in ancient Egypt must be considered a major achievement, compared to earlier times, even if it would naturally seem very modest in relation to what would later be achieved in Alexandria and other parts of the Greek and Roman world. Even if neither surgery nor urology existed as individual specialties, the later might be said to be represented by a possible description of drainage of a hydrocele in one of the medical papyri. Male circumcision was common and female circumcision did probably exist, even if it is almost only documented from later times. Neither of these procedures were, however, of a medical nature. There is no support for the notion that the Egyptians performed castrations, and the attribution of lithotomies to the ancient Egyptians is based on a faulty reading of a late source.

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