

## SURGERY IN ANCIENT MESOPOTAMIA

by

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Many medical and therapeutic cuneiform texts have been recovered from sites in ancient Mesopotamia, but no specifically surgical text has yet been found. Although it is possible that surgical texts may be found in the future, it is rather unlikely. Their absence cannot be taken as proof that the ancient Mesopotamians did not practise surgery; it is probable that surgical techniques were handed down orally and demonstrated by actual example.<sup>1</sup> Some degree of expertise must have been acquired by military surgeons in the field when they accompanied Assyrian and Babylonian armies on military campaigns. Mention of some actual surgical operations is found in Hammurabi's code of law, in which a knife was used by the doctor (A.ZU, *asū*) to operate on the patient.<sup>2</sup> However, treatment of superficial traumatic lesions was very conservative; operative surgery apparently was rare.<sup>3</sup> More serious lesions were also treated conservatively; fractures were usually not reduced and then immobilized by the surgeon,<sup>4</sup> treatment being restricted to bandages and oil dressings.

Trephining of the skull occasionally took place in antiquity. A trephined child's skull dated to Iron Age II (c. 1100–800 BC) was discovered in north-west Iran, and the patient probably survived the operation.<sup>5</sup> But evidence for trephining has not been

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*Abbreviations:* **AHw:** W. von Soden, *Akkadisches Handwörterbuch*, Wiesbaden, Harrassowitz, 1951–81. **AMT:** R. C. Thompson, *Assyrian medical texts*, London, Trustees of the British Museum, 1923. **BAM:** F. Köcher, *Die babylonisch-assyrische Medizin in Texten und Untersuchungen*, 6 vols, Berlin, De Gruyter, 1963–80. **BBS:** L. W. King, *Babylonian boundary stones and memorial tablets in the British Museum*, London, Trustees of the British Museum, 1912. **BWL:** W. G. Lambert, *Babylonian wisdom literature*, Oxford, Clarendon Press, 1960. **CAD:** *The Assyrian dictionary of the Oriental Institute of the University of Chicago*, Chicago, Oriental Institute, 1956–. **CH:** Codex Hammurabi in G. R. Driver and J. C. Miles, *Babylonian laws*, 2 vols, Oxford, Clarendon Press, 1955–56, vol. 2 (1955). **CT:** *Cuneiform texts from Babylonian tablets in the British Museum*, London, 1896–. **KADP:** F. Köcher, *Keilschrifttexte zur assyrisch-babylonischen Drogen- und Pflanzenkunde*, Berlin, Akademie Verlag, 1955. **KUB:** *Keilschrifturkunden aus Boghazköi*, Berlin, 1926ff. **MSL:** *Materialien zum sumerischen Lexikon*, Rome, 1937–. **STT:** O. R. Gurney and J. J. Finkelstein, *The Sultantepe tablets I*, London, 1957.

<sup>1</sup> R. Labat, 'À propos de la chirurgie babylonienne', *J. Asiat.*, 1954, **242**: 207–18, see p. 207. G. Majno, *The healing hand*, Cambridge, Mass., Harvard University Press, 1975, p. 40.

<sup>2</sup> CH paras 215–219.

<sup>3</sup> Majno, op. cit., note 1 above, p. 46. R. C. Thompson, 'Assyrian prescriptions for treating bruises and swellings', *Am. J. Sem. Lang.* 1930, **47**(1): 1–25, see prescription nos. 221, 224, 225.

<sup>4</sup> CH paras 221–223, 206. G. R. Driver and J. C. Miles, *Assyrian laws*, Oxford, Clarendon Press, 1975, p. 384, MA 8.81: trauma of testicles. C.-F. Jean, *Archives royales de Mari II*, Paris, Impr. Nationale, 1950, p. 127, l. 7–8: wound from *waspum* stone. CT 22.114.11–13 possibly refers to an unspecified disease of the testicles.

<sup>5</sup> R. Mallin and T. A. Rathbun, 'A trephined skull from Iran', *Bull. NY Acad. Med.*, 1976, **52**(7): 782–7, pp. 782, 786. Also from Lachish in the 18th dynasty (1580–1350 BC): P. Thomson, 'Expedition to Lachish 1935–6', *Arch. Orientforsch.*, 1936/37, **11**: 273–4.

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found in Mesopotamian burials. It is possible that a pointing amoebic abscess of the liver needed actual surgical intervention,<sup>6</sup> but most abscesses were treated very conservatively.<sup>7</sup> It is known that castration (*malas/šū*, to pluck out) was practised on young male captives under medical supervision by the Assyrians, and it was also a punishment in Assyrian law.<sup>8</sup> The mortality rates from this mutilation must have been very high. Eunuchs were often placed in positions of great authority by the Assyrians, and were examined by court doctors in order to assess the efficiency of the operation before their employment at court.<sup>9</sup> The Babylonians also employed eunuchs and used even royal captives as such in their harems.<sup>10</sup>

The surgeon had a variety of implements for his use, many of them being similar to, and derived from, those which were used domestically.<sup>11</sup> It is therefore often quite difficult to distinguish between implements used by a surgeon and those used by a household.<sup>12</sup>

Non-specific instruments which were derived from household or kitchen equipment included various types of sieve (*nappū*, *nappītu*, *mahḫaltu*). They were made from reeds or rushes, and were of different sizes and of different sized mesh. Sieves were certainly used when making up medical prescriptions.<sup>13</sup> Mortars and pestles (*abuttu*, *bukannu*, *mazuktu*) may have been made of stone or of wood. They were hand-operated, and could crush seeds and cereals to a variable degree of fineness. In medical prescriptions, separate items were often ground to a fine flour (*zīd*),<sup>14</sup> usually in small quantities. *Namad/ndu* was a measuring vessel for dry materials, but its volume is not known.<sup>15</sup> *Naḫba/uṣu* may have been a stone vessel for ointment. It seems to have been used by royalty and therefore probably contained expensive or rare materials.<sup>16</sup> It was unlikely to have been available to the lower social classes for their medicaments.

<sup>6</sup> R. C. Thompson, 'Assyrian prescriptions for diseases of chest and lungs', *Rév. Archéol.*, 1934, 31: 1–27, see no. 130, and the suggestions by Labat, *op. cit.*, note 1 above, pp. 216–17.

<sup>7</sup> A. Finet, 'Les médecins au royaume de Mari', *L'Annuaire de l'Institut de Philologie et d'Histoire Orientales et Slaves*, vol. 14 (1954–57), Brussels, 1957, pp. 123–44, see p. 132: text A 140 1.6–8, from above his ear *šetum* (? abscess) runs out. R. C. Thompson, 'Assyrian prescriptions for diseases of the feet (contd)', *J. Roy. Asiat. Soc.*, 1937, ii, pp. 413–32, see no. 202. l. 43–51. *Idem*, 'Assyrian prescriptions for diseases of the ears', *ibid.*, 1931, i, pp. 1–15, see no. 80 col. III, 1.9–14.

<sup>8</sup> Driver and Miles, *op. cit.*, note 4 above, p. 390, MA 18.80; 19.92; 20.97; p. 388, MA 15.54.

<sup>9</sup> A. K. Grayson, *Royal inscriptions*, vol. 1. *From the beginning to Ashur-resha-iṣhi I*, Wiesbaden, Harrassowitz, 1972, p. 132, para. 859: Tukulti-Ninurta I's decree (1244–1208 bc).

<sup>10</sup> 2 Kgs. 20: 18.

<sup>11</sup> J. R. Kirkup, 'The history and evolution of surgical instruments 1. Introduction', *Ann. Roy. Coll. Surg. Engl.*, 1981, 63(4): 279–85, see p. 281.

<sup>12</sup> A. Castiglioni, *A history of medicine*, New York, Knopf, 1958, p. 43, fig. 13: bronze surgical instruments from Nineveh.

<sup>13</sup> D. Goltz, 'Studien zur altorientalischen und griechischen Heilkunde. Therapie-Arzneibereitung-Rezeptstruktur', *Sudhoffs Arch.*, Beiheft, 1974, 16: 1–345, see p. 37: *sim, napū* = Sieben (sieves). AMT 53.1 col. III, 1.9: *nap-pi-i* . . (in broken text).

<sup>14</sup> Goltz, *op. cit.*, note 13 above, p. 33: *s/zāku*, *SUD* = (zer)stossen, p. 35: *GAZ, ḫašālu* = zerstoßen; also *pāṣu* and *dakāku*. AMT 3.5.9: powdered vetch, powdered peas and camomile you shall bray. AMT 8.1.12: *zid* (*na₄*)*suluppi TUR(ār)* . . powdered date stones you shall reduce.

<sup>15</sup> MSL 7 Hh X. 196: *namandu*, a graduated vessel for food.

<sup>16</sup> CAD, 1980, vol. 11(1), p. 134, quotes R. Borger, *Die Inschriften Asarhaddons, Königs von Assyrien*, no. 8 para. 5. l. 2: stone containers filled with oil fit for princes. Also BM 93088, referring to Sennacherib's gift to his son, "I gave this stone vessel (to my son)".

Specifically surgical implements included the following articles. A spoon or spatula (GIŠ. DÍLIM, (giš) LIŠ, *itgurtu*, *itqūru* was made of metal or wood, and came in varying sizes for different uses. This term was also used for the actual ointment applied by the doctor.<sup>17</sup> A spatula (GIŠ. DÍLIM. Ì. ŠÉŠ, *napšal/štu*) was also used for anointing, and again the term was also used for the ointment itself.<sup>18</sup>

The hollow stalk of a reed (MUD, MUD.Á, *uppu*) was used as a pipette. This instrument may also have been made of lead (MUD.Á.BÁR, *uppu abaru*),<sup>19</sup> but more often a tube of bronze or copper was favoured by the doctor.<sup>20</sup> The tube had to be relatively small in diameter to be suitable for insertion into the urethra or external auditory meatus, or for the instillation of eye drops. It is possible that *zirīqu* may also be a variety of tube or pipette for the application of medicines.<sup>21</sup> The instruments may be made of clay or wood. Bronze or copper were probably the materials of choice, both being strong, malleable, and firmer than lead. Another form of pipette or hollow reed stalk (GI.SAG.TAR, *takkussu*) was suitable for such relatively delicate tasks as the instillation of medicine into the eyes.<sup>22</sup>

Metal tweezers were known in antiquity.<sup>23</sup> They were used cosmetically by women for depilation. Shears or scissors (*si/erpu*) were also known, but they were coarse metal instruments, mainly used for shearing animals.<sup>24</sup> Scissors and knives were sharpened on a grindstone (NA<sub>4</sub>.MAŠ.DÀ.A, *mešēltu*). The blade to be sharpened may have been of metal, stone, flint or even of obsidian. Both flint and obsidian (*šurru*) could be readily sharpened and made into excellent surgical blades. A surgical chisel (UMBIN, *imṭū*), shaped like a human finger-nail, suggests the shape of a sharpened flint edge.<sup>25</sup> Other types of surgical knives are known, but variations in shape and form are not properly understood. *Quppū*, for example, was a small knife which was used on the eye.<sup>26</sup> A

<sup>17</sup> BAM 435 col. V, l. 9–10: 32 drugs for witchcraft either in wine or in beer from a spoon of tamarisk he will drink. BAM 124 col. II, l. 50: the surface of the sore you will wipe, and put the *itquru*-salve on it. B. Parker, 'Administrative tablets from the N-W palace at Nimrud', *Iraq*, 1961, 23: 15–67, p. 33 (ND 2490 and ND 2609) l. 26: 2 DÍLIM.MEŠ = 2 (bronze) spoons.

<sup>18</sup> B. Landsberger, 'Texts from the series HAR.ra = ḥubullu', *Arch. Orientforsch.*, 1937, 12: 135–41, see p. 138, l. 12. P. A. Deimel, *Šumerisches Lexikon II(2)*, Roma, Pontif. Inst. Bibl., 1930, p. 377, l.14. BAM 159 col. VI, l. 49: 7 drugs for an ointment. BAM 388 col. I, l. 11: 14 drugs, salve for *kis libbi*.

<sup>19</sup> BAM 240 rev. l. 46: by means of a tube of lead, he blows (the medicament) on her body. BAM 516 col. II, l. 11: you apply seven times with a lead spoon and afterwards you will not remove it.

<sup>20</sup> AMT 58.6.6: (by means of) a tube of copper, into his penis you shall blow (the medication) with your mouth. BAM 111 col. II, l. 25–26: in pressed oil you will bray it, in a copper tube you will apply it into his penis. BAM 510 col. II, l. 25: mint and styrax through a copper tube into his eyes you will blow.

<sup>21</sup> CAD, 1961, vol. 21, p. 134 quotes the single, isolated text RA 15.76 rev. l. 7: your pour (the medication) into his left nostril by a *zirīqu*.

<sup>22</sup> BAM 3 col. I, l. 39: refined oil in a pipette you will blow into his nostril. BAM 42 rev. l. 56: he aspirates (with) a pipette. BAM 503 col. II, l. 57 and 515 col. II, l. 43: you insouflate with a pipette into the interior of his eyes.

<sup>23</sup> CAD, 1956, vol. 6, p. 128, quotes text KAV 205 l. 20, 27, 35: (copper and tin given to a smith) for two sets of barber's knives and (one tweezer) for depilating. AHw, p. 329: *hasāpu*, to pull out.

<sup>24</sup> CT 55.252. 1–2: 40 (metal) shears for the shearing.

<sup>25</sup> CT 11.31 col. IV, l. 40: UMBIN, finger-nail; *imṭū*, instrument (obsidian blade). AHw pp. 379–80, *imṭū* 2 quotes text AOTU 1.309 l. 19 (parallel to (giš) UMBIN): with an *imṭū*-(obsidian) blade he cuts you. CAD, 1956, vol. 5, p. 138: *gurgurru* 1g2' quotes text Lugale XIII l. 41: "obsidian.. the craftsman.. split you with the chisel".

<sup>26</sup> MSL 9.207d and MSL 6 Hg B IIIk:*quppū* A.ZU, a surgeon's knife. BBS no. 6 col. II, l. 54: a dagger at his neck and a knife (*quppū*) at his eye.

barber's razor (GÍR.ŠU.I, *naglabu*) was a knife used by the surgeon. It was a relatively large-bladed instrument made of copper and compared to a sword.<sup>27</sup> It was a relatively heavy and clumsy instrument, and not so easy to sharpen as an obsidian blade. But *karzillu* was a more delicate, smaller knife used for surgical incisions.<sup>28</sup> It may be made of bronze or copper, and could indeed make incisions so deep<sup>29</sup> that the patient could die as a result.<sup>30</sup> This may be the knife with leaf-shaped blade of the Ninevite surgeon.<sup>31</sup> It is associated with the probe or cannula and the coarse-toothed saw from the same collection of instruments.

A blunt, club-shaped instrument (GIŠ.TUKUL, *kakku*) was used in obstetrics.<sup>32</sup> It was made from different metals,<sup>33</sup> and its use for extraction of the foetus suggests that it may have been some form of primitive scoop, possibly having a hook or projection on it—the word *kakku* may also refer to a thorn.<sup>34</sup>

Various other surgical instruments are mentioned in texts, but often their specific characteristics are not clearly defined. The thorns from a tree or plant (*šu/illū*) might be used by the surgeon for stitching wounds, and were curved for convenience of use.<sup>35</sup> Thus, stitching of wounds was known early in time both in Mesopotamia and in Egypt,<sup>36</sup> (but ligation of blood vessels apparently was not done before the time of Celsus,<sup>37</sup> c. 50 AD); *šillū*, moreover was clearly used as a type of pin.<sup>38</sup> Thorns, of course, can inflict severe and penetrating wounds. *Šukurru*,<sup>39</sup> *katātu*,<sup>40</sup> *dalū*,<sup>41</sup> and *gub/pru*<sup>42</sup> were needles or pins similar to *šillū*, made of wood, bronze, copper or animal horn and used in therapy.<sup>43</sup> It is probable that they were used with fine thread for stitching: fine thread was known to ancient Mesopotamians, who were capable of manufacturing the *sapāru* net of fine, thin mesh.<sup>44</sup> However, there is no mention of treating acute haemorrhage in the medical texts.

<sup>27</sup> CT 12.13 col. IV, l. 6: sword (*patru*), razor (*naglabu*). CT 19.32(K5+) col. III, l. 36: you lance this sore with a razor (*naglabu*). Jean, op. cit., note 4 above, p. 139, rev. l. 18: a razor (*naglabu*) of one minah weight.

<sup>28</sup> MSL 7 Hh XII 48; MSL 7 Hg A col. II 233: knife of a doctor.

<sup>29</sup> See CH paras 215 l. 57, 61; 218 l. 76, 80; 219 l. 86; 220 l. 90.

<sup>30</sup> CH paras 218 l. 78; 219 l. 87.

<sup>31</sup> Castiglioni, op. cit., note 12 above.

<sup>32</sup> J. V. Kinnier Wilson, 'Childbirth and congenital disorders' in *Diseases in antiquity* (ed. D. Brothwell and A. T. Sandison), Springfield, Ill., Charles C. Thomas, 1967, pp. 203–6, on p. 203.

<sup>33</sup> J. Bottéro, *Archives royales de Mari VII*, Paris, Impr. Nationale, 1957, letter 305.

<sup>34</sup> KADP 5 col. II, l. 28: thorn of a reed.

<sup>35</sup> BAM 515 col. II, l. 33: you shall stitch their eyes with a thorn-needle. AMT 73.2.7: you make a bow of a thorn.

<sup>36</sup> J. H. Breasted, *Edwin Smith surgical papyrus*, 2 vols, University of Chicago Press, 1930, see cases 10, 14, 23, 26, 28, 47.

<sup>37</sup> Majno, op. cit., note 1 above, p. 328.

<sup>38</sup> CAD, 1962, vol. 16, pp. 193–4: *šillū* quotes Bab 4 pl. 4 no. 2 l. 21: "a woman whose *šillū*-pin a handsome man has not opened".

<sup>39</sup> MSL 6 Hh VI 234–235: *šil-lu-u/šu-kur-ru*, thorn-needle/lance-like needle.

<sup>40</sup> BWL p. 44 l. 100 Comm.: *šil-la-tum//ka-ta-a-tum*, a needle.

<sup>41</sup> CAD, 1959, vol. 3, p. 56: *dalū* A quotes Diri II 155–155a: *ši-lu-ú/da-lu-ú*, needle. Diri VI col. III (or IV) l. 69: *da-al-la URUDU.IGI.DÙ*; *šil-lu-u*, a copper needle.

<sup>42</sup> CAD, 1956, vol. 5, p. 118: *gub/pru* B quotes Diri VI E 66: *šu-kur URUDU.IGI.DÙ*: *gub-rum*, copper needle.

<sup>43</sup> BAM 482 col. I, l. 64: If a man, his temples hurt him, with horn of draught animal once, twice or thrice you will stick them. AMT 61.5 obv. l. 5 If a man, his testicle suffers from *mungu*-disease, you will stick it with needles.

<sup>44</sup> G. Dossin, *Archives royales de Mari X*, Paris, Geuthner, 1978, letter 80, l. 14–15: in the net that he has woven.

Bandages were commonly used in treatment, even for dealing with fractures. Although many varieties are mentioned in texts, it is difficult to distinguish between most of them. *Riksu* and *ulāpu* were both made of woven material, usually wool and not linen; *tapšu* was only a non-specific covering.<sup>45</sup> These bandages could be firmly bound on (*rakāsu*) to parts of the body; *ulāpu* may have been a soiled or used medical dressing.<sup>46</sup> On the other hand, *ešu* and its synonyms appear to describe a bandage for the upper part of the leg, a site where a very firm bandage would be needed.<sup>47</sup> Less selective were *t/ṭurru*,<sup>48</sup> which could be repeatedly bandaged on a diseased area and often was combined with local drugs for treatment,<sup>49</sup> and also *ṣim/ndu*,<sup>50</sup> a bandage specifically used by the doctor, which may even have been shaped like the bag containing his instruments.<sup>51</sup> *Šuhattu* was a medical sling,<sup>52</sup> and *šiš/rṣu* a linen bandage which was torn or badly damaged.<sup>53</sup> *Napdū*, *niglallu*, *maksū*, *makraku*, *zappu*, and *naš/ltiptu* were all types of bandage,<sup>54</sup> the differences between them being unknown. But the *la/ippu* was a useful, more generalised wad or tampon which might be impregnated with drugs, and was often made of wool and not linen.<sup>55</sup> *Mēlu* is specifically a bandage used as a neck poultice.<sup>56</sup> *Nēbhu* and synonyms describe a bandage which might be strap-like, possibly being used as a sling.<sup>57</sup> Polypharmacy was common, several drugs being added to the medical dressing before its application to the patient, and bandages containing drugs were replaced when necessary.<sup>58</sup> Drugs were only used on patients after they had been carefully tested and checked.<sup>59</sup>

In ancient Mesopotamia wool was freely available and widely used by all members of society. Tampons, wads, and medical dressings (*la/ippu*, *itqu*) may have been made

<sup>45</sup> CT 18.14(K 169) rev. col. III, l. 47–52: *tapšu-tašapšu-riksu-ulapu-ṭamutu-adapu-emutin*, a wrap-wrap-bandage-bandage-woven material-fringed garment- a band.

<sup>46</sup> AMT 20.1. 34: a (soiled) bandage in a band. BAM 506 obv. l. 5: a (soiled) bandage for inflammation of his ears you will bind on him. CT 18.14(K 169) rev. col. III, l. 53–54: *enišu-qarnu*, a bandage- dirty bandage.

<sup>47</sup> CT 18.13 rev. col. III, l. 6–7: *riksu-ešu*, bandage- leg bandage. CT 18.19(K 4377) rev. l. 6: *ešu*: *mazaḥu*, a band.

<sup>48</sup> CT 41.26. 30: you bind on a bandage.

<sup>49</sup> AMT 66.4 col. I, 2 /4: six times / seven drugs for bandaging.

<sup>50</sup> AMT 102, l. 35: with salve (*napšaltu*) and bandage (*ṣindu*). AMT 102, l. 40: seven drugs for the bandage.

<sup>51</sup> CT 18.24(K 10053) col. II, l. 5 and CT 18.13d: *ṣindu ša asi*, doctor's bandage. Ibid., l. 7, ibid., l. f: *biṣru*: MIN MIN, physician's bag: doctor's bandage.

<sup>52</sup> AHW 1261: *šuhattu* quotes text SpTU 36 l. 15 "his intestines are supported by a bandage (sling)".

<sup>53</sup> CT 2.2. 12: linen bandage (*šištu*). MSL 10 p. 133 item 204: torn bandage (*širṣu*).

<sup>54</sup> AHW 737: *napdū*, Verstärkungsband. CT 18. 24(K 10053) col. II, l. 4–6, 8; and CT 18. 13c-e, g: *niglallum-maksū-makraku-zappu*, various medical bindings. MSL 13 p. 115, l. 18 *naštiptu*: something for helping the patient = bandage.

<sup>55</sup> BAM 240 rev. l. 49: you make a tampon, sprinkle it with oil, place it in her vagina. BAM 3 col. IV, l. 21: seven drugs you bray, roll a wad, and put into his ears. BAM 503 col. I, l. 23: you form it on a wad and put in his ears. CT 23.3 obv., l. 17: you make a wad, you bind it on his leg and ankle bone. BAM 3 col. IV, l. 19: fifteen drugs on a wad for *qāt eṣemmi* disease you will pour them in cedar oil and put them into his ears.

<sup>56</sup> STT 58, l. 21: you put their poultice (*mēlu*) on the man's neck.

<sup>57</sup> CT 18.13(K 169) rev. col. III, l. 41–45: *nēbhu*, a type of belt or binding.

<sup>58</sup> AMT 79.1, l. 30: these eight different poultices. BAM 152 col. II, l. 11: a compress for the diseased anus you will apply.

<sup>59</sup> BAM 3 col. IV, l. 22: these are proved tampons. BAM 161 col. II, l. 10: tested and suitable for use. BAM 303, l. 24: a tested cure from the hands of an expert. BAM 410 obv. l. 7: these are proved tampons. AMT 40.2. 9: a tested poultice, a secret of the exorcist. AMT 105.1. 21: tested and checked ointments and bandages which have been excerpted.

of wool, or even of horse hair (*zappu*), but linen bandages were also known.<sup>60</sup> Cotton wool, made from the cotton tree (*Gossypium arboreum* L.) was known at least from the time of Sennacherib (c. 700 BC) in Assyria.<sup>61</sup>

Although obsidian produced a fine cutting-edge for knives,<sup>62</sup> metal became more important, but metal shears were only used from c. 1000 BC in sheep husbandry.<sup>63</sup> Copper instruments were used by doctors for delicate and exacting work,<sup>64</sup> and they also used copper basins in which to prepare their medications.<sup>65</sup> They probably recognized the advantages of metal containers, which did not cause preparations to change in volume or quality, unlike wooden or stone containers, which were porous and permitted absorption and desiccation of drugs.

Although Mesopotamian surgery tended to be very conservative, occasionally major surgical procedures were attempted, but we do not know their ultimate results.<sup>66</sup> In no text relating to operations is there any mention of anaesthesia. This is unexpected, because the ancient Mesopotamians had considerable knowledge of pharmacy, relying mainly on plants, although some chemical and mineral substances were also used. It is probable that wine was given to patients before general surgery,<sup>67</sup> it was certainly used as a vehicle for therapeutic substances in Mesopotamia, but not in sufficient quantity to be useful for anaesthesia. Sometimes frankincense (*kanaktu*) or myrrh (*murru*) were added for analgesia.<sup>68</sup> The bark and leaves of willow (*šarbatu*) contain salicylates, and they were taken internally for the relief of pain.<sup>69</sup>

Stronger analgesic and narcotic drugs were, however, available to the doctor, and were given to the patient orally. These drugs have a long history of use in Mesopotamia, certainly from early in the second millennium BC. Mandrake (NAM.TAR, *pilū*) was often prescribed alone but could be combined with other drugs.<sup>70</sup> Henbane (<sup>4</sup>HAR.HUM.BA.ŠIR, *sākiru*), widely distributed in the eastern Mediterranean region,<sup>71</sup> was used both externally and internally in medical prescriptions.<sup>72</sup> Hemp (*azallū*) was

<sup>60</sup> BAM 543 col. II, l. 13: you sprinkle a piece of linen with oil (as medicament). BAM 580 col. I, l. 8: you put a linen bandage on him and he will live.

<sup>61</sup> D. D. Luckenbill, *The annals of Sennacherib*, University of Chicago Press, 1924, p. 111, l. 55, 56: trees such as grow on the mountains and in Chaldea, together with trees bearing wool. Ibid., p. 116, l. 64: the wool-bearing trees they sheared and wove the wool like garments.

<sup>62</sup> R. J. Forbes, *Studies in ancient technology VII*, Leiden, Brill, 1966, pp. 123–4.

<sup>63</sup> R. J. Forbes, *Studies in ancient technology IV*, Leiden, Brill, 1987 ed., pp. 7–8.

<sup>64</sup> BAM 515 col. II, l. 7: a copper knife with butter you will smear.

<sup>65</sup> BAM 124 col. I, l. 23: you mix in a copper vessel (<sup>urudu</sup>ŠEN.TUR). BAM 515 obv., col. II, l. 14, 22, 23: mix (drugs) in a copper vessel.

<sup>66</sup> Majno, op. cit., note 1 above, p. 52. K. Haeger, *History of surgery*, London, Starke, 1989, p. 19.

<sup>67</sup> S. J. Bermann, 'Comments on F. Rosner's notes about anaesthesia in Bible and Talmud', *Anaesth. Analg. curr. Res.*, 1971, 50: 300–1.

<sup>68</sup> AMT 66.7.17: with frankincense and oil you will attack the disease, he shall drink it for three days and he will recover. BAM 1 col. I, l. 22: myrrh for stricture of urethra. BAM 503 col. I, l. 31: myrrh among eight drugs for fumigation of ears. Note the possible indication of sedation in Mark 15.23.

<sup>69</sup> BAM 112 col. I, l. 5: among 37 drugs taken for urinary disease. BAM 548 col. I, l. 14 and also 549 col. I, l. 10: styrax taken internally.

<sup>70</sup> BAM 237 col. IV, l. 5: seed of myrtle and caper and mandrake root for gynaecological disease. BAM 461 col. III, l. 18: mandrake root and arnoglossum for stomach sickness. AMT 59.1.30: powdered mandrake and star-thistle drunk for strangury.

<sup>71</sup> R. C. Thompson, *Dictionary of Assyrian botany*, London, British Academy, 1949, p. 216.

<sup>72</sup> BAM 237 col. IV, l. 8: laurel, thistle and henbane seed drink for the menses. AMT 31.1.7: henbane among several drugs for strangury.

grown in the ancient Near East,<sup>73</sup> and was used both as an intoxicant and for the relief of pain, usually by drinking extracts of the seed, flowers or leaves.<sup>74</sup> The opium poppy (*irru*, *araru*) was cultivated in Mesopotamia, and its extracts were frequently used externally and internally in prescriptions.<sup>75</sup> These analgesic drugs were also applied locally, especially for lesions of the skin, for toothache or as anal suppositories.<sup>76</sup> Thus, the prevention of pain was attempted by doctors in antiquity.

Operative surgery probably was severely restricted in antiquity by the lack of suitable anaesthetics. It is known, for example, that urinary calculus did occur in ancient Mesopotamia, but no operative procedures for this painful affliction are known.<sup>77</sup> Furthermore, it should be noted that treatment of even simple lesions of the eye was unsatisfactory, and no local anaesthesia was available for active treatment of cataract.<sup>78</sup>

The surgeon was very limited in knowledge of internal human anatomy. The knowledge of anatomy was limited to that of animals prepared for sacrifice; human dissections and post-mortems were not done in Mesopotamia. The doctor practised a rather humble form of folk medicine which was slightly lower than that of his Egyptian colleagues. From the medical texts, there is no evidence of specialization in any branch of surgery. In particular, it should be noted that surgical intervention was not provided in cases of difficult or obstructed labour, or for gynaecological conditions;<sup>79</sup> paediatrics did not flourish independently in ancient Mesopotamia, for both the child and the women tended to be less important in society than the adult man. Circumcision was not practised in ancient Mesopotamia.

The doctor was expected to practice his art on humans and on domestic animals, but true veterinarians (*muna'isu*) were also known. There are texts which refer to animals and to humans in the same context.<sup>80</sup> The standard of operative procedures on animals was no higher than that of surgery on humans, although the knowledge of animal

<sup>73</sup> Thompson, op. cit., note 71 above, p. 222. Forbes, op. cit., note 63, p. 59.

<sup>74</sup> BAM 1 col. I, l. 59: hemp, a drug for mental depression, not to be taken in food or drink. BAM 237 col. IV, l. 1: seed of hemp, Ammi and saffron drunk for control of menses. BAM 435 col. IV, l. 15: hemp and other drugs bray in beer.

<sup>75</sup> BAM 168, l. 43: poppy capsule with other drugs for stomach diseases. BAM 168, l. 48: opium poppy for strangury. Note BAM 124 col. II, l. 39: poppy seed in butter and pig's fat mixed in a copper vessel.

<sup>76</sup> BAM 3 col. II, l. 47: henbane, castor oil and other drugs for head disease. CT 14.23(K 259). II. 1/2: mandrake/mandrake root: a drug for a diseased tooth, put it on the tooth itself. AMT 43.1.3-4: opium and other drugs mix in fat and apply as a suppository. AMT 94.2.78: nettle seed, opium poppy, hellebore, pine turpentine, mix in fat and put in his anus.

<sup>77</sup> BAM 396 col. II, l. 22: after the application of drugs, he will pass the stone by urination. BAM 396 col. II, l. 25: if a man is ill from the urinary stone, you pour the drugs on his sore place and he will recover.

<sup>78</sup> BAM 510 col. IV, l. 40: incantation for removing a straw, a splinter of wood or anything from the eyes. BAM 515 col. II, l. 49: his eyes are full of cataract (*gissu*) (broken text). BAM 515 col. IV, l. 3: if a man has bilateral cataract (drug treatment given).

<sup>79</sup> But note Kinnier Wilson, op. cit., note 32 above.

<sup>80</sup> W. Hausmann, 'Veterinärhistorische Keilschrifttexte aus Mesopotamien', *Hist. Med. Vet.*, 1976, 1(3): 82-6, on p. 82. CT 14.41(Rm 362) l., 4: similar text to BAM 159 col. V, l. 35-36: drug for colic of a horse, mix in wine and rub it on the abdomen. E. E. Knudsen, 'An incantation tablet from Nimrud', *Iraq*, 1959, 21: 54-61. Text ND 5577 obv., l. 1-26: ritual against cattle disease. *Ibid.*, l. 27-43: and obv. 44-rev. 48: incantations against human diseases. A. Goetze, 'An incantation against diseases', *J. cun. Stud.*, 1955, 9: 8-18. Text UIOM 1059, l. 11-12: sickness caused fever in the sheep and lambs, it made listless the children in the arm of the nurse.

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anatomy was considerably higher. Although the Egyptian doctor also practised on both humans and animals,<sup>81</sup> his knowledge of human anatomy was much more extensive than that of his Mesopotamian colleagues. In Egypt, surgical conditions were often considered to be treatable and even curable, including those caused by weapons.<sup>82</sup> Egyptian surgical treatments were simple, but slightly more advanced than those in Mesopotamia; wounds were stitched,<sup>83</sup> the cautery was used,<sup>84</sup> and so was the surgical knife.<sup>85</sup> Egyptians had a well-tries pharmacy, and polypharmacy, but lacked analgesics and anaesthetics, although the opium poppy was known.<sup>86</sup> The Egyptian and Mesopotamian surgeons were trained in different ways, and had little contact with each other except at the occasional medical consultation on politically important patients.

<sup>81</sup> G. Sacino, 'La figura nel medico nell' antico Egitto', *Med. nei Sec.*, 1968, **5**(4): 3–8, see pp. 6–7.

<sup>82</sup> Breasted, op. cit., note 36 above, vol. 1, pp. 46, 153.

<sup>83</sup> Ibid., cases 10, 14, 23, 26, 28, 47.

<sup>84</sup> Ibid., case 39. B. Ebbell, *The Papyrus Ebers*, London, Milford, 1937, cases CVI, CVIII.

<sup>85</sup> P. Ghalioungui, *The house of life*, Amsterdam, Israël, 1973, pp. 90–1. Trephination was very rare in ancient Egypt. Ebbell, op. cit., note 84 above, case LXXXVIII: remedy for šndt which is cut off; case CIX: 'šwt infestation excised at operation.

<sup>86</sup> H. E. Sigerist, *History of medicine*, vol. 1, Oxford University Press, 1951, p. 336. *Dio. Sic. Hist.* 1. para. 82 l. 3. A.-P. Leca, *La médecine égyptienne*, Paris, DaCosta, 1971, pp. 436–7. S. Y. El-Gammal, 'Ancient Egyptian pharmacy', *Hamdard*, 1985, **28**(2): 41–53, see pp. 44–6.