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Historico-medical considerations on the use of mummy as a drug: a *bona fide* ineffective medicament or a noxious charlatanry?

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ABSTRACT

Pharmaceutical cannibalism has been historically significant across various cultures. Egyptian mummies, often studied for their mummification techniques, were also utilized in medicine, believed to have healing properties due to misconceptions about their embalming process. The term *mumiya*, which originated in Mediaeval Arabic, came to denote both mummified bodies and bitumen due to misinterpretations by Latin translators of Islamic medical texts. Scholars like Al-Kindi, Rhazes, and Ibn Sina promoted bitumen as a treatment for various ailments. The confusion led to the use of actual mummy parts instead of bitumen, especially after supplies of this material dwindled in the 13th century. Scepticism about the therapeutic benefits of *mumia vera* grew, particularly after the 18th century, raising concerns on its possible harmful effects on patients. In this paper, by reassessing the works of André Thevet (1516-1590)

and Ambroise Paré (1510-1590) in light of modern medical knowledge, we make the case for *mumia vera Aegyptiaca* to have been a potentially harmful form of pharmaceutical cannibalism.

Keywords: Anatomy; Cannibalism; History of medicine; Mummy; Mumia vera; Toxicity.

Introduction

In the history of humankind, pharmaceutical cannibalism has played a role, it being both considered a valid medical therapeutical approach and a religious element. Body parts, including bones, were reduced to powder and administered to patients in the hope to corroborate their health. Such a phenomenon appears to have been widespread across different ethnicities and cultures and diachronically present¹.

This is true also of Egyptian mummies, which have long been the subject of curiosity and scientific investigation, with increasing rigour only in the past century and a half². Generally, mummy studies have focused on the mummification techniques, the materials used for this, diachronic change in methods, the interpretation of social class based on mummification, as well as the study of the individual bodies themselves. However, in addition to being a topic of scientific curiosity, these objects played a significant role in medicine and pharmacy, both in the East and the West as mummies were used as medicaments, prescribed for centuries by generations of physicians and chemists. This was due to a misunderstanding of how mummies were produced. The blackened colour of many mummies was thought to come from bitumen, which was thought to have been a key component in the embalming process³.

The Roman author Pliny the Elder (AD 23-79) praised the properties of bitumen, which he acknowledged to be present in nature in different forms (a slime from a lake in Judæa, an earth from an area near Sidon in Syria or in the liquid state from Zacynthus or Babylon), which would, however, be classified under the all-encompassing category of “pissasphaltos” in the Greek language. Out of those varieties of bitumen, Pliny extols the qualities of naphtha, said to be “naturally astringent, dispersive, contractive and agglutinating”. Of Babylonian bitumen he says that it is used in the treatment of gout, cataract, cutaneous conditions, toothache, respiratory ailments, dysentery, epilepsy etc. With reference to haematologic matters, he adds that “*taken with vinegar, it dissolves and brings away coagulated blood*” [*cum aceto vero potum discutit concretum sanguinem ac detrahit*] and later remarks its alleged haemostatic and wound healing actions [*sanguinem sistit, vulnera colligit*]. Mendelsohn maintained that Pliny was probably referring to bitumen/mummy substance scraped from embalmed corpses from Ancient Egyptian tombs⁴.

Thus, the Mediaeval Arabic term *mumiya* (Persian: موميا; in its European linguistic equivalents *mumia* and *mummy*) ended up meaning mummified bodies, or body parts, as well as bitumen⁵.

Hence, the medical use of mummies was based on a misinterpretation by the Mediaeval Latin translators of the medical works by Muslim scholars⁶ such as Al-Kindi (ca. AD 801-

873)⁷, Rhazes (AD 854-925)⁸ and Ibn Sina (Avicenna, c. AD 908-1037)⁹ who, following in the footsteps of the Greek physician Pedanius Dioscorides (ca. AD 40-90), had advocated the implementation of bitumen in its derived form of naphtha of Babylonian origin [I.73: νάφθα, ὅπερ ἐστὶ τῆς Βαβυλωνίου ἀσφάλτου περιήθημα], as a cure for a variety of ailments ranging from ulcers to neurological diseases such as epilepsy¹⁰. Bitumen originates from the so-called mummy mountain in Persia (modern-day Iran) as well as various other sources near the Red Sea and the Dead Sea Area¹¹. Although a misinterpretation by European scholars seems the most likely explanation, an alternative view on the matter is offered by Mendelsohn, who rather attributed the shift from using bitumen proper to utilising mummy parts based on economic factors, such as scarcity of supplies of bitumen from the 13th century onward¹². Additionally, an even subtler further distinction came into being between genuinely Egyptian mummy parts (*mumia vera Aegyptiaca*) and recently mummified ones, as a result of the fact that the authorities in Egypt and Syria started to fine Jewish merchants of *mumia* by the beginning of the 17th century, which had engendered the production of new “mummies” made from the recently deceased and unclaimed bodies of individuals¹³. Although *mumia vera* remained available in chemist’s shops across Europe until the 20th century¹⁴, research has shown how already in the 16th century a growing aura of scepticism surrounded the alleged beneficial therapeutical advantages of *mumia vera*, which was almost never prescribed after the turn of the 18th century¹⁵. What still remains controversial and largely unexplored is whether the administration of such drugs might not only have been ineffective on the targeted disease but also might have had detrimental outcomes on patients’ health. As ethical and conservatorial constraints obviously do not permit one to try to experiment with mummified remains on living people, this question can only be answered by reassessing the scant literature mentioning potential noxious effects of *mumia vera*.

Materials and Methods

Several 16th century publications cited in the Dannefeldt 1985 publication have been re-analysed, specifically the works of the explorer André Thevet’s (1516-1590) *Cosmographie de Levant*¹⁶, *La cosmographie universelle* (1575)¹⁷, and the surgeon Ambroise Paré’s (1510-1590) *Discours de la mumie, de la licorne, de venins, et de la peste* (1579)¹⁸. The relevant passages have been translated into English from Middle French originals and the results have been analysed in the light of modern clinical pathophysiology as prescribed by palaeopathographic approaches to palaeopathological matters¹⁹. These data have been contextualised with historical medical knowledge and recent chemical analyses on mummy tissue and preserved *mumia vera* specimens.

Results

In his *Cosmographie de Levant*, Thevet²⁰ mentions the fact that [*D*]e ces Momies usent les Apoticaire, “Apothecaries use such mummies” and describes the discovery

and retrieval of embalmed bodies, yet he does not add data on the medical effects of the *mumia*.

Thevet then dedicates a section of his *Cosmographie Universelle* to Egyptian mummies (Fig. 1) in which he specifically states²¹:

Estant en Alexandrie d'Egypte, ie veis vn Iuif Medicin, qui prenoit le corps d'un enfant momié, & mettoit la chair & oz en pouldre, de laquelle il prenoit tous les matins avec du ius de Palmier, enuiron deux doigts: & me donna de tel breuuage par trois fois. Quelle raison m'amenera-il, par laquelle il me preuue pluſtoſt ceſte force eſtre és oz puluerifez, & mis en quelque boiſſon ou potage, que non point en la chair meſme, qui a eſté oincte & mixtionnee avec telle quantité de drogues? Mais laiſſons cela, & continuons le reſte de noſtre diſcours momial.

[Eng. Being in Alexandria, I saw a Jewish physician, who took the body of a mummified child, and put the flesh and bone powder, of which he took every morning with palm juice about two fingers; and he gave me such beverage three times. What reason he will bring me, by which he demonstrates to me that this virtue is in the pulverized bones, and put in some drink or broth, rather than in the flesh itself, which has been anointed and mixed with such a quantity of drugs? But let us leave it there, and let us continue the rest of our discourse on mummies.]
(Authors' translation)



Fig. 1. Modern-era Egyptians looking for mummies in the tombs and pyramids from Thevet's 1575 work (p. 43).

For his part, Ambroise Paré (Fig. 2) in the later work²² *Discours de la mumie, de la licorne, de venins, et de la peste* recalls this episode in his dissertation of the limited therapeutical value of mummy as a medicine, adding further details:

Et comme Theuet se dict auoir expérimenté en soy mesme, en ayant quelquefois pris en Egypte, d'où elle vient, à la suscitation d'un médecin Iuif, mais d'auantage luy causa plusieurs fois facheries et accidents, comme douleur et deuoyement d'estomach, vomissement et puanteur de bouche: pour ces raisons non seulement ie n'en ay voulu ordonner, mais ainsi ie conseille bien de n'en prendre aucunement.

[Eng. And as Thevet claims to have experimented on himself, having taken it (i.e. mummy as a medicine) sometimes in Egypt, whence it comes, suggested by a Jewish physician, but furthermore it caused him several times issues and accidents, such as pain and nausea, vomiting and fetid breath: for these reasons not only did I not want to prescribe it, but, therefore, I do suggest not to take it at all].

(Authors' translation)



Fig. 2. Detail of David d'Angers's 1839 statue of Ambroise Paré (galerie David d'Angers, Angers, France). Image in the public domain from *Wikimedia Commons*: https://fr.wikipedia.org/wiki/Ambroise_Paré#/media/Fichier:David_d'Angers_-_Ambroise_Paré_02.jpg

The subsequent editions contained in Paré's *Oeuvres Completes* are less detailed than the 1582 version and, instead of "a Jewish physician" (*vn medicin Iuif* = un médecin juif), mentions "one Jew called Idere" (*vn nommé Idere Iuif* = un juif nommé Idère)²³:

Theuet dit l'aour expérimenté en soy-medesme, en ayant quelquesfois pris en Egypte, à la suscitation d'un nommé Idere Iuif. A ceste cause ie proteste de iamais n'en ordonner; ny permettre à aucun en prendre, s'il m'est possible.

[Eng. Thevet says that he has experienced it on himself, having sometimes taken some in Egypt, at the instigation of a Jew named Idere. For this reason I protest that I will never order any, nor allow anyone to take any, if it is possible for me to do so.]

The divergence between the two versions is found epitomised as a footnote in the 1841 edition.

Discussion

According to Dannefeldt, André Thevet, following the suggestion of the Jewish physician, tried *mumia vera*, and experienced "pain in the stomach and fetid breath"²⁴. Dannefeldt seems to be quoting Paré regarding Thevet, rather than Thevet himself, as Thevet only gives precise information on posology, and makes no mention whatsoever of any negative effects on his health caused by the ingestion of mummy as a medicine. In addition, from his account it would appear that the supposed beneficial effects of *mumia vera* are to be attributed to the final admixture of the pulverised mummy tissue with several other substances. Paré's description of Thevet's reaction to ingesting the pharmaceutical *mumia* (and whatever else the drug contained) provides a precise symptomatology, which in modern clinical terms can be translated as: gastralgia/retrosternal pain and dyspepsia, accompanied by nausea and vomiting, and halitosis (*fetor oris*). Indeed, *deuoyement d'estomach* (= devoyement d'estomac), literally meaning "a deviation/an inversion of the stomach", can be interpreted as gastroesophageal reflux and/or vomiting since in first edition (1694) of the *Dictionnaire* of the *Académie française* as *deuoyement* was synonym with *indigestion d'estomac* and *flux de ventre*, which both referred to indigestion and inverse emptying of the stomach in a diarrhoic fashion (the flux). Latin synonyms for this expression are offered in François Pomey's (1618-1673) *Dictionnaire Royal* (ed. 1680): *stomachi re-spuentis nausea, fastidium* and *stomachi resolutio*²⁵. In addition, linguist Giovanni Veneroni (1642-1708)'s *Dizionario Francese ed Italiano* still translated *devoiemet d'estomac* with *vomito* ("vomiting")²⁶. Moreover, the word *vomissement*, used by Paré, clearly indicates the act of vomiting being also translated into the Latin forms *vomitus* or *dissolutio stomachi*²⁷.

Since Thevet fails to mention such symptoms in his accounts, it can be deduced that either Paré obtained such information in a different manner or he ascribed to Thevet

symptoms he himself had witnessed in his own patients. After all, he wrote²⁸ that he had seen that it was not only of no help to the patients [*non seulement elle ne profite de rien aux malades*] as his own experience with patients to whom he had prescribed it had shown him [*come i'ay plusieurs fois veu par experience à ceux ausquels on en auoit fait prendre*] but it also caused a series of additional health issues or side-effects, such as severe stomach pain [*grande douleur à l'estomach*], halitosis [*puanteur de bouche*], severe emesis [*grand vomissement*]. From Paré's clinical experience [*veu par experience*] it also emerged that, while it was thought that, instead of clotting blood, *mumia vera* had haemorrhagic properties [*esmuuoir le sang et le faire d'avantage sortir hors de ses vaisseaux*]. Editions of Paré's work after 1579 may offer a textual explanation since after the aforesaid symptomatological passage they mention the incident involving Thevet (cf. p. 483, note 1 of Paré's 1841 edition): this may be the result of Paré's own revision of the text in 1581 in order for it to be inserted in the 1585 edition of his complete works²⁹.

Specimens of *mumia vera* from historical collections (*Deutsches Apothekenmuseum*, Heidelberg, Germany) have been chemically analysed yielding in one case the following composition: cellulose-based fibers (from the linen bandages), wooden fibers, cedrium, beeswax, pistachio resin, hydrolysed fat (human sebum, adipocere), polyunsaturated plant oil and Dead Sea asphalt, the bitumen may originate from the animal mummies³⁰. As the container originates from the 18th century, one might suspect that the content is not a genuine Egyptian mummy but a fake composition from this time period. The alleged remains of Joan of Arc (1412-1431), in fact remains of a Late Period Egyptian mummy (ca. 650 BC), unmasked as faked Catholic relics, were also shown to contain portions of *mumia vera*. Chemical analysis highlighted the presence of heavy metals such as aluminium (Al), barium (Ba), lead (Pb) and bromine (Br)³¹. From a clinical perspective the symptoms described by Paré can be explained as follows.

Halitosis

Mummified remains can have a variety of smells. Harris in the 1970s, during his investigation of Egyptian royal mummies, recorded that some of them emanated a bad oily smell - especially those belonging to the 17th dynasty since later royal mummies (18th-20th dynasties) either are inodorous or even have a pleasant odour (e.g. perfume, lichen, etc.)³². The persistence of mummified remains in the oral cavity could be accounted as a reasonable explanation. Alternatively, the digestion of such mummified fragments might have contributed to the production of fetid breath.

Gastrointestinal symptomatology (dyspesia, retrosternal pain, nausea, emesis)

In the number of components potentially found in mummy preparations, certainly asphalt, deserves careful consideration. Petroleum bitumen is extremely common in

mummies from lower social classes³³ and, above all, after the New Kingdom Period (ca. 1550-1070 BC)³⁴. The presence of the elementary petrochemical benzene in it can be seen as a likely causative explanation for an insult to the upper digestive tract such as caustic injury, nausea, vomiting, typical manifestations of local irritation after benzene ingestion; without forgetting a series of neurological effects ranging from loss of consciousness and dizziness to euphoria and seizures³⁵. The fact Paré fails to mention noxious effects on the respiratory airways can be explained by means of the substance being administered *per os*, and not inhaled. Similar effects on the upper digestive tract may also be explained as a result of aluminium-caused irritation of the inner mucosal surfaces, as much as the aforementioned neuropsychiatric outcomes could be explained by means of barium, lead or bromine intoxication³⁶.

Pro-haemorrhagic (and pro-leukemic) properties of benzene

Paré's later allusion to the fact that *mumia vera* would expose patients to haemorrhagic risk also points in the direction of toxicity of benzene, which is known to be one of the many causative agents of thrombohaemostatic diseases by virtue of its impairing coagulation factors, fibrinolysis and blood coagulation³⁷. In addition, benzene is a well-known cancerogenic factor responsible for a series of neoplastic outcomes such as acute leukemia and bone marrow abnormalities³⁸. From a historical perspective, since the link between benzene exposure and aplastic anaemia (at the time known as "purpura haemorrhagica") was only first established in 1897 based on a study of Swedish female workers from a rubber tire factory where benzene was used as a solvent, Ambroise Paré's intuition predates the Swedish study by over three-hundred years³⁹. This once again shows how brilliant past observations, not always necessarily by medical experts, may predate clear scientific descriptions⁴⁰.

Resin, notably pistachio and conifer resin, were frequently found in Egyptian mummies⁴¹. Such organic components were used by the ancient embalmers because of their antibacterial properties. Great quantities of embalming material is in fact simple beeswax. Buckley reports that bitumen was not detected in Late Period and Greco-Roman mummies tested in his study⁴². This contradicts the claims of Bahn⁴³. Thus, Buckley recommends great caution on the material actually used in embalming⁴⁴.

It is therefore plausible, that modern made, fake *mumia vera* using bitumen had a much more noxious effects on human health than real Egyptian mummy using resin (plant, conifer and balsamic) and beeswax.

Despite Paré's informative description, it is striking to note how highly appreciated *mumia vera* was and widely administered even by prominent physicians, but, at the same time, really scant accounts of its noxious effects were compiled. This could be explained by means of authority and the placebo effect – apparently so strong as to minimise the realisation that this practice represented a form of cannibalism – it might have exerted in past centuries. Nonetheless it cannot be excluded that, *mumia* being

prescribed for a lot of pathologies ranging from neurological to gastrointestinal ones, a confounding or cumulative effect of the pre-existing pathologies might have masked the additional health burden induced by ingestion of mummy preparations. This appears particularly true of instances such as vomiting and nausea, most likely coupled with retrosternal pirosis and/or pain, which would have only been aggravated by the ingestion of such drug.

Conclusions

The harmful effects of *mumia vera* preparations have long been overlooked in medical treatises, in spite of their widespread use for centuries. While genuine *mumia vera Aegyptiaca*, mostly containing antibacterial resins and beeswax may had some pharmaceutical effects as claimed by Islamic scientists in the Middle Ages, the later forgeries of the later Middle Ages up to the 18th century, made with fresh corpses and the use of noxious bithumen had a most negative effect on human health and caused the decline of *mumia (non-)vera* as effective medicine. The translation of *mumiya* used by Ibn Sina and other Arab scientists as bitumen was mistranslated and understood as mummy in Europe. Later “mummy” was even used as term of a esoteric substance: *Mumie, überaus feiner, subtiler geistiger Theil, der einem ieden Menschen angebohren* [Mummy, a most fine, subtle spiritual part, which is given to every human by birth]⁴⁵. The most likely explanation was that a combination of placebo effect and an overlap between caustic and toxic injuries caused by petroleum bitumen and/or other heavy metals and similar symptoms for which the drug was administered contributed to ignorance or neglect of harmful effects of this preparation.

Finally, Ambroise Paré’s intuition of the haematic toxicity of *mumia vera* (namely of its component benzene) seems to have predated its actual discovery by more than three centuries. The possibility in future to further archivistically elucidate records of noxious outcomes of its prescription would shed more light on the real health burden this misconceived medicine had in the past.

This study, once more, highlights how the ancient Egyptian civilisation with religious and funerary practices can also yield valuable biomedical and pharmaceutical information⁴⁶.

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