

# The Human Brain in Ancient Egypt

A Medical and Historical Re-evaluation  
of Its Function and Importance

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# Contents

<b>Acknowledgements</b> .....	vi
<b>Abbreviations</b> .....	vii
<b>Chronology</b> .....	viii
<b>Chapter 1: Introduction</b> .....	1
1.1 Research aims and purpose.....	2
1.2 Ethical considerations.....	2
1.3 Chapter outline .....	2
<b>Chapter 2: Literature review</b> .....	4
2.1 Part one: mummification .....	4
Classical writings .....	4
Twentieth century writings.....	4
Twenty first century writings .....	5
Literature review .....	9
2.2 Part two: medicine.....	9
Classical writers .....	9
Twentieth century scholars .....	9
Twenty First Century Scholars .....	10
2.3 Conclusion.....	10
<b>Chapter 3: A re-evaluation of mummification and treatment of the brain</b> .....	11
3.1 Introduction .....	11
3.2 Evisceration .....	11
3.3 Identification of the four sons of Horus with the protection of specific internal organs.....	14
3.4 The heart.....	16
3.5 Treatment of the brain .....	19
3.5.1 The brain after death .....	19
3.5.2 Ancient sources.....	21
3.5.3 Packing material .....	21
3.5.4 Head/brain amulets .....	22
3.6 A radiological survey of the treatment of the brain in 33 Ancient Egyptian anthropogenic mummies .....	22
3.6.1 Method .....	22
3.6.2 Results .....	25
3.7 Findings .....	28
<b>Chapter 4: Trauma care and neurosurgery in Ancient Egypt</b> .....	41
4.1 Healthcare: Sources of evidence .....	41
4.2 Neuroanatomy in Ancient Egypt.....	42

4.3 Papyrus Edwin Smith .....	42
4.3.1 Introduction .....	42
4.3.2 Case 1: Scalp laceration penetrating to the bone .....	44
4.3.3 Case 3: Penetrating head injury with skull perforation .....	46
4.3.4 Case 4: Compound, displaced, elevated skull fracture .....	47
4.3.5 Case 5: Open, comminuted, depressed skull fracture .....	48
4.3.6 Case 6: Open comminuted, depressed skull fracture and dura laceration .....	49
4.3.7 Case 7: Frontal cutting wound with compound skull fracture penetrating the frontal air sinus. Uncomplicated and infected: tetanus .....	50
4.3.8 Case 8: Closed head injuries with comminuted skull fracture .....	51
4.3.9 Case 13: Closed comminuted nasal fracture with basilar skull fracture and cerebral contusion.....	52
4.3.10 Case 17: Cranio-facial injury with comminuted maxillary zygomatic fractures and basilar skull fractures .....	53
4.3.11 Case 20: Temporo-zygomatic stab wound with skull perforation and basilar skull fracture .....	53
4.3.12 Case 31: Cervical vertebral dislocation with spinal cord and head injuries .....	53
4.3.13 Case 33: Cervical burst fracture with spinal cord injury and brain contusion .....	54
4.4 Conclusion.....	54
<b>Chapter 5: Palaeopathological evidence of cranial surgery.....</b>	<b>56</b>
5.1 Introduction .....	56
5.2 Trepanning .....	56
5.3 Skull surgery.....	57
5.4 Conclusion.....	60
<b>Chapter 6: Conclusion .....</b>	<b>61</b>
6.1 Purpose and research questions.....	61
6.2 Chapter outline .....	62
6.3 Future research .....	63
6.4 Final thoughts .....	63
<b>Appendix A .....</b>	<b>64</b>
<b>Appendix B: Book of the Dead: Spell 30b (Faulkner, 2010).....</b>	<b>66</b>
<b>Appendix C: Book of the Dead: Spell 166: Spell for a headrest (Faulkner, 2010) ...</b>	<b>67</b>
<b>Appendix D .....</b>	<b>68</b>
<b>Bibliography .....</b>	<b>71</b>

## List of Figures

Figure 1.1.	Pawiamen (IMP00105) is a male aged 22-44 dating to the Late Period. He has been mummified with resin applied to the back of the head, but the skull is intact with no attempt at excerebration. His desiccated brain, and meninges are visible posteriorly in the cranial vault.....	1
Figure 2.1.	Naturally preserved brain (Smith, 1902) .....	7
Figure 2.2.	Results of Study by Loynes, 2015: Total 53, TNC 39, TFC 4, Transbasal 1, TNC with Orbital 1, Orbital 1, Intact Brain 6.....	8
Figure 3.1.	Redpath Mummy RM2720, is a female, aged 18-24. An axial view of her thorax shows desiccated lungs, but the heart has been extracted. ....	12
Figure 3.2.	Mummification bed discovered in storage chamber KV63, now housed in the Mummification Museum, Luxor. The stage of mummification in which this bed was used is unknown, but its design would have enabled bandaging of the mummy (Image © Aziz, 2022) .....	12
Figure 3.3.	Canopic jars with sons of Horus heads: Hapi with a baboon head and Duamutef with a jackal head, Mummification Museum, Luxor (Image © Aziz, 2022) .....	13
Figure 3.4.	Canopic jars with heads of sons of Horus: Qebehsenuf with a falcon head and Imseti with a human head, Mummification Museum, Luxor (Image © Aziz, 2022) .....	13
Figure 3.5.	A wall scene in the New Kingdom Period tomb of Queen Nefertari, (QV66). Top centre, facing right, the falcon headed God Horus sits with his four sons: Duamutef, Qebesenuf, Hapi and Imseti (Image © Aziz, 2023). ....	14
Figure 3.6.	IMP00101 Mummy of a man, age 44-55, Third Intermediate Period. Axial view showing loose viscera and resin, but the heart is absent.....	16
Figure 3.7.	Red Path Mummy (RM2718), male, age 20-25, Ptolemaic Period. Arrow pointing to mediastinum and heart. ....	17
Figure 3.8.	Headrest amulet less than 1 inch in length dating to the Late Period (Image © Met Museum, Public Domain). In this study Peftjauneith (Mummy IMP00109), dating to the Late Period was found to have a headrest amulet placed behind the neck (See Figure 3.9 below).....	23
Figure 3.9.	IMP00109 Peftjauneith, male, aged 22-44. Arrow pointing to headrest amulet. Peftjauneith has been excerebrated through a transnasal route by breaking through the ethmoid bone. Some remnants of brain tissue are visible in the resin that has been used to fill the cranium. ....	23
Figure 3.10.	Head/brain djed pillar amulet on frontal bone and winged scarab on the parietal region of a mummified female, aged 20-35, dating to circa 20 BCE to AD 10. Directly beneath the winged scarab, CT scans revealed, a thin sheet of metal with engravings of a winged scarab. The brain had been completely extracted and resin had been poured twice into the cranial cavity. The mummy was discovered in a Theban Tomb and is thought to be the daughter of Tanuat and her husband Montsuef, a high ranking official (Image © National Museums of Scotland).....	24
Figure 3.11.	Osiris: God of the dead and resurrection, with the head of a djed pillar, Tomb of Queen Nefertari QV66, Valley of the Queens (Image © Aziz, 2022). ...	24
Figure 3.12.	In the sample of 33 mummified individuals: 52% were fully excerebrated, 12% were partially excerebrated and 36% had intact brains. ....	27
Figure 3.13.	IMP00099, Tadis or Ta(net)kharu, female, age 40-52, Third Intermediate Period. Arrows showing complete excerebration and transnasal route.....	27

Figure 3.14.	IMP00103, Hor, male, age 22-44, Late Period, partial excerebration with some remnants of brain tissue. Route of excerebration is TNC through disruption of the ethmoid bone.....	28
Figure 3.15.	IMP00096, Khonsuemma'a (Kherut), male, age 30-44, Third Intermediate Period, TNC through disruption of ethmoid bone followed with insertion of linen in cranial vault. ....	28
Figure 3.16.	IMP00109, Peftjauneith, male, age 22-44, Late Period, following excerebration resin has been poured into the cranial cavity. Although excerebration has been carried out meninges are visible in the resin as is some linen. ....	29
Figure 3.17.	IMP00109, Peftjauneith, male, age 22-44, Late Period, PET colour option used to show large opening of ethmoid to carry out excerebration and introduce resin into the cranial cavity. Meninges are visible in the resin as is some linen. ....	29
Figure 3.18.	IMP00113, Hor, male (21-22), Ptolemaic, arrow pointing to nasal tampon. Arrows showing resin has been poured twice in the cranial cavity. There is some debris trapped in the resin.....	30
Figure 3.19.	IMP00083, Braided Lady, female, age 25-29, New Kingdom Period, shrunken intact desiccated brain is visible posteriorly. ....	30
Figure 3.20.	IMP000083, Braided Lady, coronal view, arrow showing intact desiccated shrunken brain. ....	31
Figure 3.21.	IMP00104, Harerem, male, age 45-55, arrow showing eye plate. Excerebrated TNC route. Arrow showing remnants of meninges. ....	31
Figure 3.22.	In the sample of 33 mummied individuals 55% had undergone TNC, 6% TFC, 36% had an intact brain and in 3% the route of excerebration could not be determined.....	33
Figure 3.23.	IMP00009, Hetep Bastet, age 40+. Complete excerebration TFC route with some debris posteriorly.....	33
Figure 3.24.	Skull packed with linen and resin, Mummification Museum, Luxor (Image © Aziz, 2022). This study found 2 examples of mummies with linen and resin in the cranium. One dating to the TIP and one to the Late Period. ....	34
Figure 3.25.	IMP00111, Mummy of a Man, age 22-40, TIP, linen pack and packages containing viscera and resin with loose debris on the posterior wall of the abdomen. The heart is notably absent. ....	35
Figure 3.26.	IMP00097, female, age 40-52, TIP, mixture of resin and granular material in body cavity.....	35
Figure 3.27.	IMP00100 Petament, male, age 55-74, axial view showing canopic package and returned loose viscera lying within resin packing. No convincing evidence of heart retention. ....	39
Figure 3.28.	IMP00105 Pawiamen, male, age 22-44, granular material in thoracic cavity. ..	40
Figure 3.29.	IMP00109 Peftjauneith, male, age 22-44, heavy use of resin, canopic package and residual tissue is visible.....	40
Figure 4.1.	Schematic representation of the circle of Willis, arteries of the brain and brain stem (Rhcastilhos, 2007). ....	44
Figure 4.2.	Angiogram of arterial supply (Image © Ofir Glazer, 2006). ....	45
Figure 4.3.	(Image © Blausen.com staff, 2014). ....	47
Figure 5.1.	Skull injuries of soldiers from Tomb MMA 507, Deir el Bahri (Winlock, 1945) 59	

## List of Tables

Table 2.1.	In a sample of 131 mummified human remains, Wade found TNC to be the most common route of excerebration. Intact brains were detected in 29 individuals.....	5
Table 2.2.	CT Studies by Hawass and Saleem, 2013, 2016 and 2021 .....	6
Table 3.1.	Identification of the four sons of Horus with the protection of specific organs in the body cavity.....	15
Table 3.2.	Paragraphs in pEbers in which <i>ib</i> and <i>haty</i> are used interchangeably.....	18
Table 3.3.	Mummy Sample: *NK New Kingdom Period  *TIP Third Intermediate Period.....	25
Table 3.4.	List of subjects and treatment of the brain. (*NK New Kingdom  *TIP Third Intermediate Period  *L Late Period  *P Ptolemaic  *R Roman .....	26
Table 3.5.	In the sample of 33 mummies 36% had intact brains and 64% had been excerebrated. Of the 64% excerebrated 3 had linen in the cranium, 2 had linen and resin and 7 had resin.....	27
Table 3.6.	TNC, TFC, Intact Brain, Indeterminate .....	32
Table 3.7.	The route of excerebration could not be determined in 1 subject. TNC was the most popular route. ....	33
Table 3.8.	Treatment of the skull cavity verses treatment of the torso. ....	34
Table 3.9.	Heart retention could be confirmed in 21% of the subjects, partial heart retention in 9%, absent in 42% and indeterminate in 27% .....	37
Table 3.10.	There is considerable variability in the treatment of the body cavity. Some possible TIP trends are visible such as canopic packages and linen packing, which a larger study could verify. ....	38
Table 4.1.	List of medical cases relevant to the human brain. ....	43
Table 4.2.	Prescriptions in pEbers which include the brain of animals. ....	50
Table 4.3.	Human brain appears in cases 6, 7 and 8 (Transliteration and Translation: Sanchez and Meltzer, 2012).....	55
Table 5.1.	Possible Cases of Trepanning. ....	57
Table 5.2.	Winlock provides four cases of healed skull injuries detected in human remains from a plundered rock cut tomb MMA 507 at Deir el Bahri.....	58

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## Abbreviations

CSF	Cerebrospinal Fluid
CT	Computed Tomography
I	Indeterminate
NK	New Kingdom Period
pEbers	Papyrus Ebers
pEdwin Smith	Papyrus Edwin Smith
P	Ptolemaic
R	Roman
TBI	Traumatic Brain Injury
TFC	Transforamen craniotomy
TIP	Third Intermediate Period
TNC	Transnasal craniotomy

## Chronology

The chronology used throughout this study is Shaw (2000: 479-483)

PERIOD	DYNASTY	DATE
Predynastic		4500 – 3000 BCE
Early dynastic	1 – 2	3000 – 2686 BCE
Old Kingdom	3 – 6	2686 – 2181 BCE
First Intermediate	7 – 11	2181 – 2055 BCE
Middle Kingdom	11 – 14	2055 – 1650 BCE
Second Intermediate	15 – 17	1650 – 1550 BCE
New Kingdom	18 – 20	1550 – 1069 BCE
Third Intermediate	21 – 26	1069 – 664 BCE
Late Period	26 – 30	664 – 332 BCE
Ptolemaic		332 – 30 BCE
Roman		30 BCE

# Chapter 1

## Introduction

The human brain is a remarkable and highly complex structure of innumerable networks of neuronal synapses. Together with the spinal cord it makes up the central nervous system and controls every process that regulates the body such as breathing, temperature, movement, and cognition. It is a wrinkled, lipid rich organ, protected by three layers of membranes collectively known as meninges. It lies enclosed within the cranial vault, floating in cerebrospinal fluid. This fluid provides cushioning and maintains homeostasis of the central nervous system (Pollay, 2010; Brinker *et al.* 2014). Although the brain is not exposed to the external world, it creates our reality through an extraordinary process of electrochemical communication between cells. If one organ was worth preserving, and taking to the afterlife, it should have been the brain. Yet it is vehemently argued in the literature, that during the mummification process, the ancient Egyptians went to great lengths to rid the body of the brain. The functions of the brain, it is argued, were assigned to the heart and therefore preservation of the brain was deemed unnecessary (Brier, 2001; Wade, 2012; Ikram, 2013).

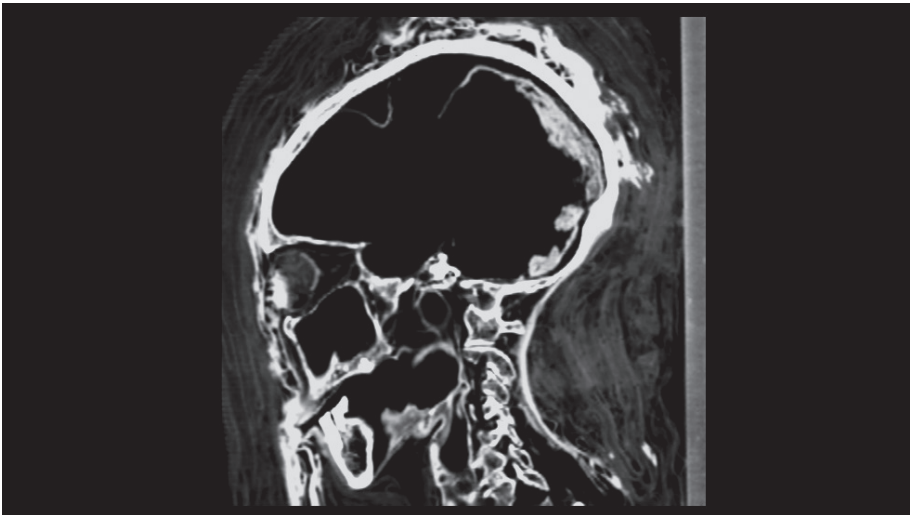


Figure 1.1. Pawiamen (IMP00105) is a male aged 22-44 dating to the Late Period. He has been mummified with resin applied to the back of the head, but the skull is intact with no attempt at excerebration. His desiccated brain, and meninges are visible posteriorly in the cranial vault.

### 1.1 Research aims and purpose

The purpose of this study is to re-evaluate some commonly held assumptions regarding medical concepts of the human brain and its treatment during anthropogenic mummification. In doing so the following questions will be addressed:

- How was the brain conceptualised in ancient Egypt and to what degree was its functions understood?
- Was ancient Egyptian medical theory largely cardio centric?
- How did treatment of the brain during the mummification process differ from organs in the thorax and abdominal cavity?
- Was mummification of the brain linked to medical concepts of the brain?

To answer these questions, I will re-evaluate the treatment of the brain during the mummification process by studying radiological data sets using ORS Visual software, a functional processing tool available within IMPACT (Picture Archiving and Communication System). Next, I will examine the medical papyri to assess what was understood of the anatomy and physiology of the brain; and finally, I will examine the palaeopathological records in the literature for evidence of cranial injuries and ensuing treatments.

### 1.2 Ethical considerations

With any study that involves the examination of human remains it is important to consider and follow ethical guidelines. Human remains preserve a record of the past life of individuals. This record contributes enormously to our understanding of ancient diseases, medical treatments, and mummification procedures. It is of the utmost importance to treat those deceased with respect and dignity and make every effort to retain their identity (Kaufmann and Rühli, 2010). In Appendix A, I have provided a list of all the individuals in my research with their name, age, sex, and where possible, the site where they were discovered. This study is based on non-invasive methods to preserve the integrity of the deceased.

### 1.3 Chapter outline

The chapters of this study are arranged as follows:

Chapter 2 is divided into sections. Part one, section 2.1 provides a comprehensive literature review of mummification in relation to the human brain. Part two, section 2.2 provides a review of the medical literature regarding the concept and function of the brain in ancient Egypt.

Chapter 3 is a re-evaluation of ancient Egyptian mummification procedures to assess how and why the brain was treated differently from the viscera. Section 3.3 traces the history of the identification of the four sons of Horus with the protection of specific

visceral organs. This is followed by a discussion of heart retention in section 3.4 to evaluate if it was part of ancient Egyptian religious ideology or a modern construct. Section 3.5 is devoted to the treatment of the brain beginning with an investigation into alterations in the biochemical environment of the brain after death followed by a discussion of excerebration, packing materials and protective amulets. Section 3.6 is a study of 33 subjects inhabiting the IMPACT radiological mummy database, to assess treatment of the brain during anthropogenic mummification. The chapter concludes with a discussion of the findings in section 3.7.

Chapter 4 looks at trauma care and neurosurgery in ancient Egypt. The main sources of evidence are discussed in sections 4.1 and 4.2 followed by a detailed look at Papyrus Edwin Smith in section 4.3. For transliterations, translations and commentaries, Sanchez and Meltzer's 2012 edition of Papyrus Edwin Smith has been selected for ease of reading and discussion of a complex manuscript. Breasted's 1930 publication has been cross referenced.

Chapter 5 sifts through the palaeopathological records for evidence of cranial surgery beginning with trepanning. This is followed by a look at skull injuries and ensuing treatment.

Chapter 6, the conclusion, provides a summary of the findings of the study followed by suggestions for future research.

The overall aim of this study is to provide a medical and historical re-evaluation of the function and importance of the human brain in ancient Egypt. This is an area of research that has not been examined in any detail. Many commonly held assumptions stem from ancient classical sources such as Herodotus (See Chapter 2, Section 2.1). This study is one of the first to utilize a multi-faceted approach in examining what was understood of the human brain in ancient Egypt.