



REVIEW ARTICLE

Cranial trepanation in *The Egyptian*[☆]

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Abstract

Introduction: Medicine and literature have been linked from ancient times; proof of this shown by the many doctors who have made contributions to literature and the many writers who have described medical activities and illnesses in their works. An example is *The Egyptian*, the book by Mika Waltari that provides a masterly narration of the protagonist's medical activity and describes the trepanation technique.

Development: The present work begins with the analysis of trepanations since prehistory and illustrates the practice of the trepanation in *The Egyptian*. The book mentions trepanation frequently and illustrates how to practice it and which instruments are required to perform it. Trepanation is one of the oldest surgical interventions carried out as treatment for cranial trauma and neurological diseases, but it also had the magical and religious purpose of expelling the evil spirits which caused the mental illness, epilepsy, or migraine symptoms.

Conclusions: Trepanation is a surgical practice that has been carried out since prehistory to treat post-traumatic epilepsy, migraine, and psychiatric illness. *The Egyptian* is a book that illustrates the trepan, the trepanation technique, and the required set of instruments in full detail.

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PALABRAS CLAVE

Antiguo Egipto;
Cirugía;
Historia de la
neurología;
Medicina y literatura;
Medicina egipcia;
Trepanación

La trepanación craneal en Sinuhé, el Egipcio

Resumen

Introducción: La Medicina y la Literatura han estado unidas desde antiguo, prueba de ello es que muchos médicos se han dedicado a la Literatura y muchos escritores han plasmado en sus obras la actividad médica y la enfermedad. Un ejemplo es la obra *Sinuhé, el egipcio* de Mika Waltari, que narra magistralmente la actividad médica del protagonista y describe la técnica de trepanación.

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Desarrollo: El presente trabajo comienza con el análisis de las trepanaciones desde la Prehistoria y se ilustra la práctica de la trepanación en *Sinuhé, el egipcio*. En esta obra se hace referencia en múltiples ocasiones a la trepanación y se detalla la forma de practicarla y el instrumental necesario. La trepanación es una de las intervenciones quirúrgicas más antiguas llevada a cabo con fines terapéuticos en traumatismos craneales y patologías neurológicas, pero también con una finalidad mágico-religiosa, para expulsar los espíritus malignos causantes de enfermedades mentales o de los síntomas de epilepsias y migrañas.

Conclusiones: La trepanación es una práctica quirúrgica realizada desde la Prehistoria en traumatismos craneales, epilepsias, cefaleas y enfermedades psiquiátricas. En la novela *Sinuhé, el egipcio* se describe con detalle la figura del trepanador, la técnica de trepanación y el instrumental necesario.

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Introduction

Since ancient times, medicine has been defined as both a science and an art, and as a sphere within which science, culture, and the humanities are not clearly delimited.¹ Many doctors have also been writers, including Anton Chekhov, Gregorio Marañón, Pedro Laín Entralgo, and Juan Antonio Vallejo Nágera. In turn, many writers have described medicine, illness, pain, and death in such works as *Don Quixote* by Cervantes, *The Death of Ivan Ilych* by Tolstoy, *The Citadel* by Cronin, *Rest Home* by Camilo José Cela, and *The Plague* by Albert Camus.^{2–5}

The Egyptian, penned by Finnish author Mika Waltari, is a powerful tale of the protagonist's medical career, his learning process, and the evolution from magical beliefs to a more scientific form of medicine. This book refers to trepanning and indicates how the procedure was performed and what instruments were used.⁶ Trepanning is a surgical procedure that has been practised since prehistoric times for head trauma, post-traumatic epilepsy, migraine, and a host of neurological disorders. However, these operations also held magical significance in ancient times.^{7–9}

The purpose of this article is to examine Waltari's literary description of trepanation while offering a historical overview of this practice.

Procedure

Cranial trepanation

Palaeopathology studies have shed light on a surgical procedure that has been practised by numerous cultures since time immemorial: trepanation. This practice consists of removal of cranial bone slabs using an instrument called a trephine, from the Greek word for 'drill'.^{7,10} Trepanning gives rise to many questions, such as the purpose of the procedure, whether it had precise indications, if it was part of a ritual, what were the most common complications, and the survival rate.^{11–13}

Trepanning seems to have been prescribed as a treatment measure for headache, mental illness, epilepsy, and most of all, head trauma. In the latter case, the procedure was

used to relieve pressure on the brain caused by fracture, to remove bone shards, or to drain haematomas.^{11,14,15}

The procedures and instruments varied according to the culture and the moment in history. In general, however, the practitioner would detach the scalp, perforate the cranium, and clean the wound before covering it with a plate of precious metal and then applying a bandage. Instruments employed included trephines, knives, tumis (T-shaped knives), saws, chisels, burins, hammers, sharp stones, and forceps. The operation lasted between 30 and 60 minutes in adults and about 10 minutes in children.⁷

Prehistory

Trepanned skulls from the Neolithic and Mesolithic periods, some as much as 10 000 years old, have been found in Japan, the Iberian peninsula, Germany, Ukraine, the Czech Republic, Hungary, France, Syria, Chile, Mexico, Peru, and Bolivia. Many of these skulls exhibit new bone formation along the edges of the orifice, indicating that the subjects survived the intervention (Fig. 1).^{10,16–19}

It is believed that between 80% and 90% of the subjects may have survived and that many deaths were due to postoperative infection and not the operation itself. These figures vary greatly depending on the historical moment, geographical location, and the technique employed.^{19–21}

In his study of more than 600 skulls, Verano calculates a survival rate of about 78%, although he is not able to distinguish between short-term and long-term survival.²²

According to Laín Entralgo, the purpose of trepanation would have been twofold: firstly, to surgically remove real or suspected accumulated material from the cranial cavity, and secondly, to magically release harmful presences that might have entered the body as the result of a curse.²³ Other authors support this assessment.^{24,25}

According to Reverte Coma, when primitive man removed a depressed bone fragment from the skull, smoothed the edges of the skull fracture, and removed necrotic tissue, his actions were rational. After repeating these actions many times, ancient practitioners would have become experts with numerous cases of successful trepanation using different methods, including grinding and drilling. These techniques were used as therapy for head trauma,

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