SURGICAL MEMORY DURING GENERAL ANAESTHESIA

Essay

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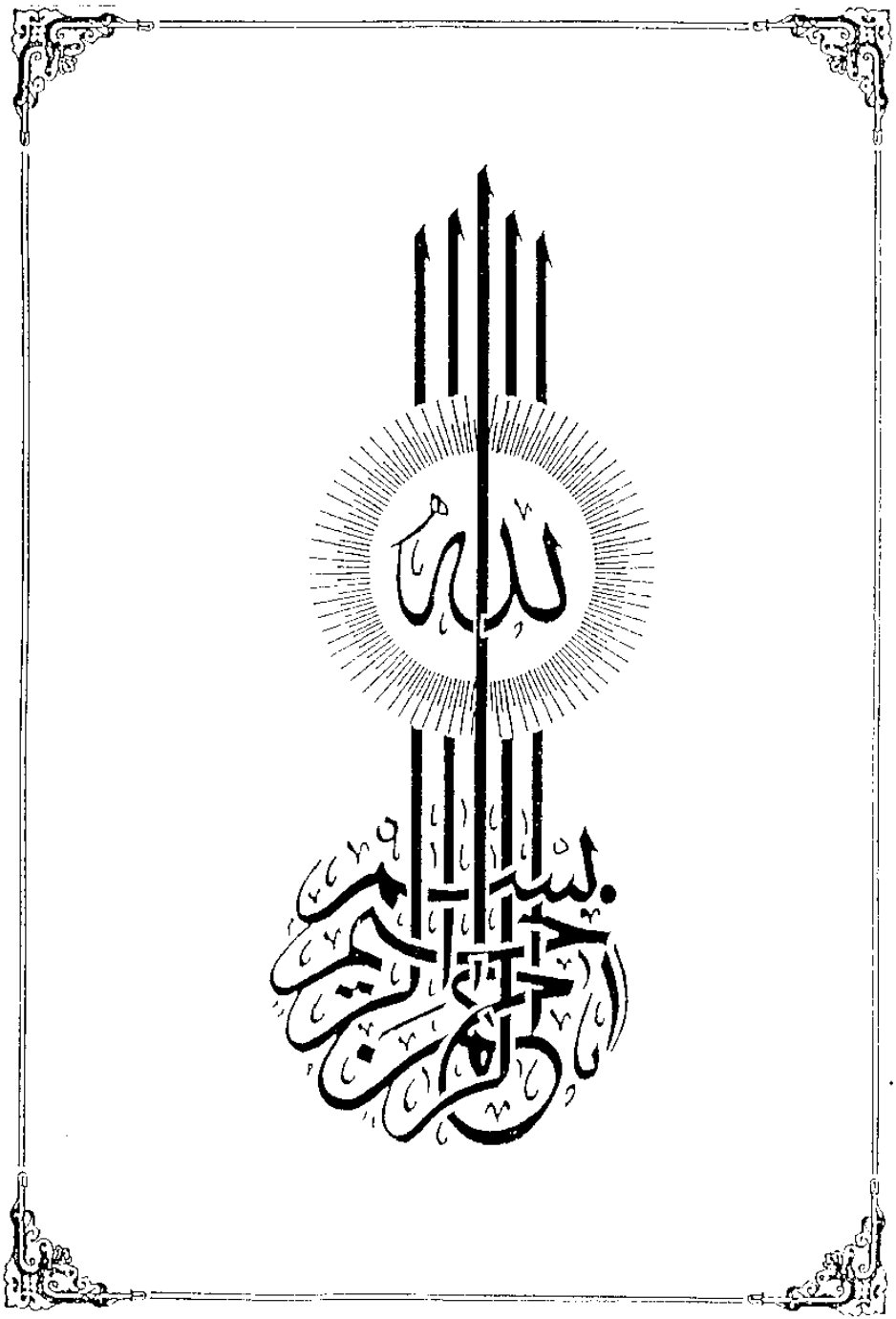
بسم الله الرحمن الرحيم

﴿قَالُوا سُبْحَانَكَ لَا عِلْمَ لَنَا إِلَّا مَا عَلَّمْتَنَا إِنَّكَ أَنْتَ الْعَلِيمُ الْحَكِيمُ﴾

«صدق الله العظيم»
(سورة البقرة آيه رقم (٣٢)



TO...

MY FAMILY

KHALED FAWZY

CONTENTS

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INTRODUCTION

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The recent interest in memory during general anaesthesia shown by general medical journals, editorials in speciality journals, and the lay press, together with recent conferences devoted to the subject, indicate that the subject is of interest to physicians, psychologists and the public media.

Many strong claims about memory during anaesthesia are being made. An editorial in lancet 1986 states; "there is now sufficient evidence to warrant the adoption of active measures to prevent every anaesthetized patient from hearing conversation in the operating theatre. It is unlikely that unconcious auditory perception can be prevented by pharmacological means". Another from the British Medical Journal concludes; "Anaesthetists should assume that any anaesthetized patient is capable of retaining verbal and other high inputs in long term memory". *(Jones and Konieczko, 1986).*

This research can be integrated into two plausible view points:

1. Conservative: consciousness and explicit recall occur rarely usually because of error on the part of anaesthesiologist, overly light anaesthesia, or patients who are resistant to the effect of anaesthetics. It is not surprising that they occur sometimes in patient who appear to be adequately anaesthetized; judgments of depth of anaesthesia are neither quantitatively precise nor infallible. These occasional instances do not reflect a more widespread phenomenon.

2. Liberal: The instances of consciousness and recall documented in the clinical reports are the "tip of iceberg". In a much larger percentage of anaesthetized patient, some information processing functions of the brain that are normally associated with awareness, such as language comprehension and learning, continue to function during adequate surgical anaesthesia without awareness or subsequent explicit recall. Sensitive assessment would reveal widespread unconscious retention of auditory information presented during anaesthesia.

HISTORICAL PERSPECTIVE

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The history of memory for events under anaesthesia is as old as the history of anaesthesia itself.

Horace Wells failed to demonstrate the anaesthetic properties of N_2O at the Massachusetts General Hospital in 1845 when the patient complained and remembered feeling pain.

One year latter, **Williams Morton**, at the same hospital succeeded in anaesthetizing **Gilbert Abbott** with diethyl ether; Abbott later reported that he had been aware of the surgery but had experienced no pain.

A little over a month after **Morton's** successful demonstration, a patient was reported who, following amputation of an arm, "thought she had got a reaping hook in her arm and that she heared the noise of sowing wood".

George Crile, the pioneer surgeon, descriped vivid memory and recall in one of his patients who had received

nitrous oxide anaesthesia in 1908. Three years later, a similar incident with the same anaesthetic was reported.

However, despite these infrequent reports, a significant "problem of awareness during anaesthesia" only appeared after the introduction of muscle relaxants in anaesthesia practice by **Griffith and Johnson** in 1942. Patients can become conscious while totally paralyzed because there is no measurement that guarantees unconsciousness in the paralyzed patient. It is interesting that the plight and misery of these unfortunate patients were prophesied by **Claude Bernard** in 1818 *(as quoted by Blacher, 1987)* while discussing the effects of curare: "In all ages poetic fictions which seek to arouse our pity have presented us with sensitive beings locked in immobile bodies. Our imagination cannot conceive of anything more unhappy than beings provided with sensation, that is to say of being able to feel pleasure and pain, when they are deprived of the power to flee the one and yearn toward the other. The torture which the imaginations of poets have invented can be found produced in nature by the action of the American poison. We can even say that the fiction falls short of reality".

Hutchinson in 1960 was the first to investigate the magnitude of the problem through a prospective study by interveiwing patients post operatively. He reported that 8 of 656 patients (1.2%) had recall of some events of their surgery. Other similar studies assessing the incidence under various premedicant and anaesthetic regimens and after different types of surgery followed.

Cheek's reports in 1959 and 1964 were the earliest in a series of studies that explored the use of hypnotic techniques to aid recall of intraoperative events. **Cheek** investigated patients who had complaints dating from previous surgery. When these patients were hypnotized, he reported that they recall negative statements that had been made about them during surgery by members of the surgical team, and this recall was followed by a complete remission of their symptoms.

Levinson's study in 1965, made statements concerning a spurious crisis during dental surgery in ten patients receiving ether anaesthesia. None of these patients had any recall of the incident in the post operative period. However, when they were interviewed under hypnosis, four patients were reported to give

verbatim or near verbatim recall of the bogus incident. Four other become anxious and emerged from hypnosis.

Wolfe and Millet in 1960 and **Hutchings** in 1961 administered positive suggestions to patients under anaesthesia and claimed highly therapeutic benefits for the patients.

Bennett et al., in 1985 used a non verbal postoperative response to message administered intraoperatively and demonstrated some learning during anaesthesia. In a double blind study, 33 patients (herniorraphy, cholecystectomy and orthopaedics) were randomly assigned to either suggestion or control groups. Suggestion patients were exposed to statements of the importance of touching their ear during a post operative interview. Compared with controls, suggestion patients did touch their ear and they did so more frequently.

EFFECT OF SUBANAESTHETIC CONCENTRATION OF DRUGS ON MEMORY