COMPARATIVE STUDY BETWEEN VENTURI JET VENTILATION AND EXTERNAL HIGH FREQUENCY OSCILLATION IN PATIENTS UNDERGOING LASER LARYNGEAL SURGERY

Thesis Submitted for Partial Fulfillment of the M. D. Degree in Anesthesia

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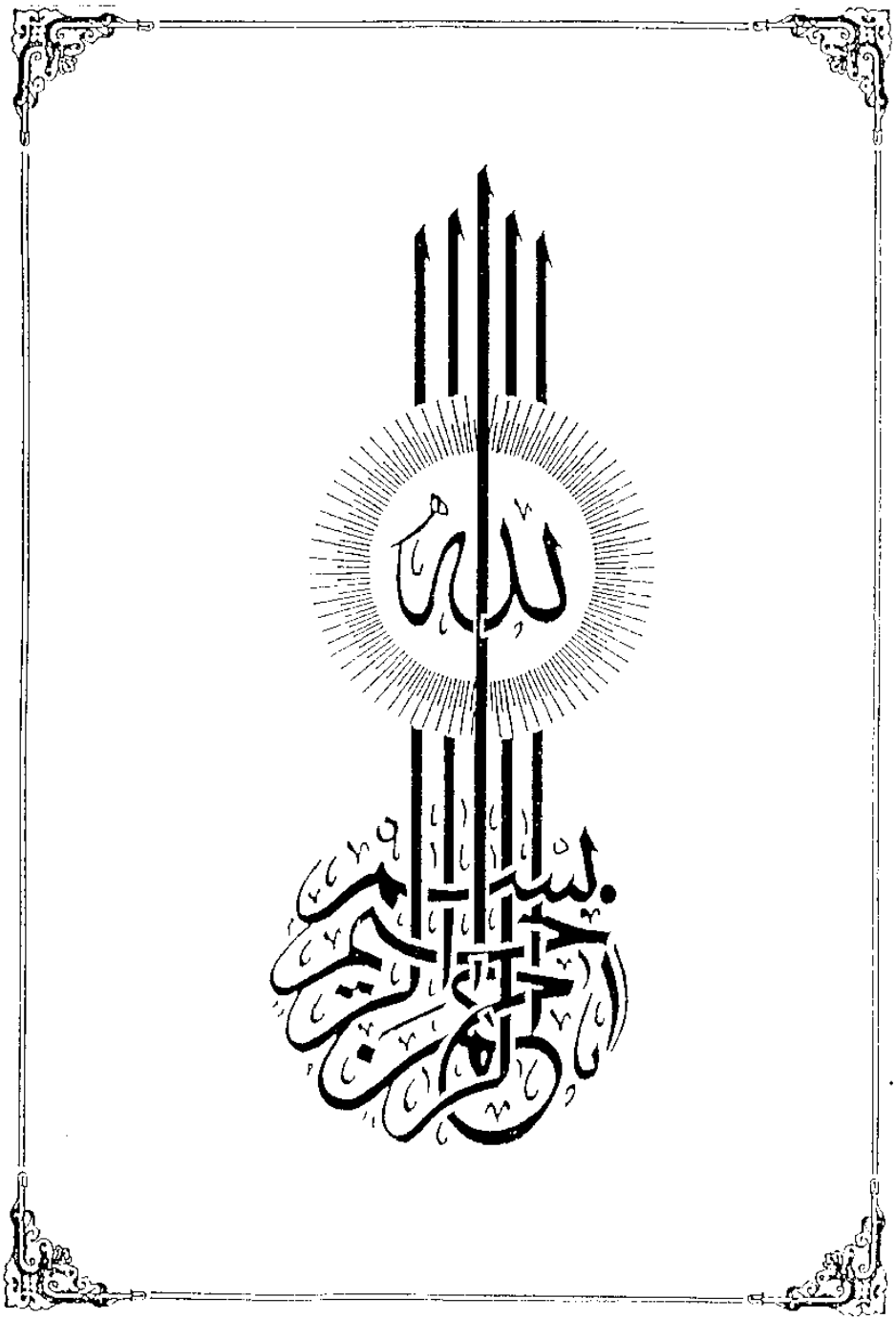

بسم الله الرحمن الرحيم

قالوا سبحانك لا علم لنا إلا ما علمتنا إنك أنت العليم الحكيم

﴿ سورة البقرة - الآية ٣٢ ﴾

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Hanan Farag

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Introduction

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In 1917, ***Albert Einstein*** recognized the existence of stimulated emissions. The first description of stimulated optical emission of monochromatic light using ruby as the active material - the ruby laser - was provided by ***Theodore Maiman*** in 1960. The more powerful neodymium-in-glass laser was discovered a year later. It was hoped that lasers would be useful in medicine for the excision of tumors, but initial expectations were not realized. Their poor absorption by non-pigmented tissue necessitated the use of large amounts of energy, with the result that the thermal effect could not be localized to diseased tissues ***(Simpson and Polanyi, 1983)***.

In 1966, at the American Optical Corporation Laboratories, ***Yahr and Strully*** discovered that the CO_2 laser can cut tissue. ***Strong and Jako*** first appreciated the potential of the CO_2 laser for use in otolaryngology in 1971. The development of the micromanipulator by ***Polanyi*** in 1974, enabling the CO_2 laser to be used with an operating microscope, greatly facilitated its use for microlaryngeal surgery. The argon laser has been used extensively in ophthalmic surgery and dermatology since about 1970, and the neodymium-in-yttrium-aluminum-garnet (Nd-YAG) laser was first introduced in 1975 for the endoscopic treatment of gastrointestinal hemorrhage ***(Van Der Spek et al., 1988)***.

The laser is powerful and has several other advantages when used in medical procedures. In addition to its power, the laser usually has the advantage of hemostasis, selective absorption by pigmented materials, the lack of trauma to healthy tissue, sterility, reduced postoperative pain and edema experienced by patients who undergo

laser procedure. The use of laser may hasten the completion of surgery ***(Sosis, 1993)***.

The high-energy density of lasers and the potential for combustion, however, pose special problems for the anesthesiologist when the surgical field is close to the airway. Fire is a risk when flammable materials are present, especially in the O_2 enriched atmosphere often used during general anesthesia. Such fires can cause severe life-threatening burns of the larynx and trachea and can also proceed up the anesthesia circuit into the operating room ***(Pashayan, 1994)***.

None of the current anesthetic techniques has so far succeeded in eliminating the risk of fire when a laser is used for airway surgery. However, non-intubation technique would certainly reduce that risk ***(Pashayan, 1994)***.

The aim of this work is to compare between two non-intubation techniques; Venturi jet ventilation (VJV) and external high frequency oscillation (EHFO) in patients undergoing laser laryngeal surgery.

Review of Literature