INTRODUCTION

The power sources used in endoscopic surgery are variable and numerous. It will continue to improve as technology progresses. Although there are differences in the reaction of the different energy sources with human tissue, the. clinical outcome appears to be much the same and depends more on the skill of the individual surgeon than the power source employed. The power sources employed in endoscopic surgery to achieve. desiccation, haemostatis and coagulation are essentially the same as those used in open surgery **(Sutton, 1995)**. The energy sources used in operative endoscopy include the following types: electro surgery source, laser source, ultrasonic source, cryocoagulation source, infrared coagulation source and thermal endocoagulator.

a) Electrosurgery energy source:

Electrosurgery is the direct transfer of radio ,frequency energy between an active electrode and dispersive electrode in order to elevate the tissue temperature for the purpose of cutting, fulguration and desiccation. Coagulating current causes tissue desiccation and its main effect is haemostatic. The current is characterized by intermittent periods of electrical inactivity. The cutting mode is a continuous current that causes actual explosion of the cell membrane. Many endoscopic surgeons use a blended current with a mixture of cutting and coagulation current **(Underwood RA et al., 1998)**. The electrosurgery source include monopolar and bipolar.

b- Laser energy source:

Laser is commonly used as the primary source for incision and vaporization during laparoscopic surgery. It is useful to use laser energy

with the operative laparoscope for several Reasons:

1- The operative laparoscope provides a straight on shot at pelvic target.

2- The operative scope provides another port of entry for laser energy.

3- The operative scope provides a channel for the bipolar electrical forceps **(Dorsey, 1997).** The laser source include many types: carbon dioxide laser (CO_2), neodymium: yttriem aluminum garnet (N d: yAG laser), potassium titanyl phosphate laser (KTP), Argon Ion laser, krypton Ion laser and Helium Neon laser.

c- Ultrasonic energy source:

Ultrasonic energy is an efficient-alternative to electrosurgery and the basis for an efficient surgical instrument. The device cuts and coagulates by using lower temperatures than those used by electrosurgery or lasers. No electricity goes to or through the patient. The ultrasonically activated scalpel (UAS) is characterized by its ability to cut and coagulate tissues simultaneously with relatively low heat and limited lateral thermal injury. The UAS has been used routinely in a number of general surgeries including laparoscopic surgeries, open surgeries of the lung and liver **(Cuschieri, et al., 1999).**

d- Cryo coagulation energy source:

Cryo surgery avoids the use of the scalpel and obviate the need for suturing. Cold protein coagulalion by cryosurgery leave the body repair mechanisms to separate the devitalized tissue. In this process there tends to be a release of cytokines encouraging regeneration and an

enhancement of local immune mechanisms. It has effects on nerve fibers particulary the finer non myeleinated nerve fibers, reduceing pain by comparison with conventional surgery in general. Cryosurgery has special merits in relationship to nerve and bone which may regenerate after therapy. This modality of treatment is extremely important in the practice of oral and maxillofacial surgery **(Brill. 1998).**

e- Infrared coagulation energy source:

The infrared coagulator delivers low temperature photocoagulation within defined parameters to a precise depth. It is safer for you, your staff and your patient. Energy is delivered to the target site in a controlled dosage through the use of an internal proprietary sensor. Infrared energy passes through a solid quartz glass light guide to a disposable tip applicator for rapid and complete haemostasis with no tissue adherence. It is safe and easy to use, no smoke and no odour of particulated matter. Infrared coagulation is a readily mastered therapy that is well tolerated by patients **(Uhlhorn et al., 2001).**