

# ***Is co2 laser Hemorrhoidectomy superior to conventional open Hemorrhoidectomy?***

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## **Abstract**

**Background:** Hemorrhoids are one of the most common surgical conditions .Conventional haemorrhoidectomy was the traditional operation for the treatment of hemorrhoids. Other modalities of treatment had been used as an alternative operations including CO2 laser haemorrhoidectomy.

**Objectives:** To determine the outcome of treatment of hemorrhoids by using CO2 laser haemorrhoidectomy and its advantages over conventional surgery

**Methods:** This is a retrospective comparative interventional study of 1024 case of third degree haemorrhoids selected out of 1300 case of hemorrhoids of different degrees, admitted to ALKINDY, ALYERMOUK teaching hospitals and ABD ALMAGEED private hospital, from May 1998 to July 2002,they were treated by CO2 laser haemorrhoidectomy and conventional surgery. They are divided into 2 groups randomly, 512 cases treated by CO2 laser (group A), 512 cases treated by conventional surgery (group B). Both groups were studied regarding operative time, hospital stay, healing time, post operative complications and cost effectiveness.

**Results:** In GROUP A, the operative time ranged from 10 to 20 minutes with an average of 13 minutes.

The hospital stay ranged from 4 to 12 hours with a mean time of 10 hours as all cases were treated as day cases. Post operative pain was minimal in 50% of patients and required simple analgesia for treatment while 50% had no pain. Bleeding occurred in less than 1% of cases, anal stenosis 3.3%, Infection recorded in 0.58% of patients.In GROUP B, The operative time ranged from 15 to 25 minutes with an average time of (19) minutes, hospital stay ranged from 24 to 48 hours with a mean time of 28 hours .Post operative pain recorded in all the patients (100%) and required narcotic analgesia for treatment, 25 patients (4.8%) had varying degrees of bleeding, 40 patients (7.8%) had infection, 25 patients (4.8%) had anal stenosis.In group A due to shorter hospital stay, earlier healing of wounds, earlier return to work which was within 7 to 10 days, the surgical treatment proved to be cost effective.

**Conclusion:** CO2 laser Hemorrhoidectomy was found to be easy and safe procedure with lower rate of complications, shorter hospital stay and cost effective.

**Keywords:** Co2 Laser, Hemorrhoids, Hemorrhoidectomy

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## **INTRODUCTION**

Hemorrhoids or piles are enlarged vascular cushions within the anal canal that have been described for many centuries and continue to form large part of colorectal work load. The incidence varies from 4.4 to 30% in different countries <sup>(1)</sup>. Hemorrhoids are divided clinically into 1<sup>st</sup> degree bleeding only, no prolapse; 2<sup>nd</sup>

degree prolapse but reduce spontaneously; 3<sup>rd</sup> degree prolapse and have to be manually reduced; and 4<sup>th</sup> degree hemorrhoids which are permanently prolapsed <sup>(2)</sup>.

Options of treatment of hemorrhoids include:

1. CONSERVATIVE: home treatment, provides temporary relief of symptoms and achieved by, Hydrotherapy with a bath tub,

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bidet or extend – able shower head. The condition can improve with warm bath causing vessels around the rectal region to relax. Cold compression, Topical analgesics, Systemic analgesics, Topical steroids may weaken the skin and contribute for further flare up, Vasoconstrictors' (phenylephrine), Topical moisturizers, Topical ointments and suppositories (proctocidy) (3).

**2. SURGICAL:** many modalities of surgical interventions are used for the treatment of mainly advanced 2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> degree hemorrhoids.

**A:** Sclerotherapy, injection of a sclerosant agent into the hemorrhoid, this will cause collapse of the vessels and the hemorrhoid will shrivel up (3).

**B:** Rubber band ligation, Barron ligation; elastic bands are applied to the internal hemorrhoid to cut its blood supply, and within several days the hemorrhoid will slough off during normal bowel motion (4).

**C:** Hemorrhoidolysis, dessication of hemorrhoids by electrical current (3).

**D:** Cryosurgery, frozen tip of cryo probe is used to destroy hemorrhoid tissue. Rarely used anymore because of side effects (5).

**E: SURGICAL EXCISION,**

Milligan and Morgan reported a surgical procedure for hemorrhoids in 1937 (6), which had been passed down to the present time which is the basis of open conventional hemorrhoidectomy (7,8), this procedure was found to be followed post operatively by severe pain, bleeding, infection, stenosis and recurrence.

CO<sub>2</sub> laser hemorrhoidectomy is one of the popular alternative methods of treatment, it allows vaporization or excision of the hemorrhoid, it seals small blood vessels allowing a bloodless field, it seals superficial nerve endings giving the patient no or minimal post operative discomfort (9,10).

CO<sub>2</sub> laser energy is absorbed by water at the surface of soft tissue resulting in vaporization of that tissue with conduction of heat into surrounding tissues allowing surgical precision and unimpaired healing (11, 12, 13).

Stapled hemorrhoidectomy, excision of tissue proximal to the dentate line which disrupts the blood supply to the hemorrhoid and it is generally less painful than complete removal of hemorrhoids and allow faster recovery time, it is mainly used for internal hemorrhoids that prolapse and bleed (14).

Tran's anal de arterializations, is minimally invasive technique using US Doppler for localization of arterial blood inflow, then arteries are tied off with simple suture and prolapsed tissue is sutured back to anatomical position without excision of tissue, this is done above the dentate line (15,16,17).

## METHODS

From May 1998 to July 2002, 1300 cases of hemorrhoids were admitted to ALKINDY, ALYARMOUK Teaching hospitals and DR ABDULMAGEED private hospital. 1024 cases were included in this study representing patients with 3<sup>rd</sup> degree hemorrhoids. 167 cases with 2<sup>nd</sup> and 4<sup>th</sup> degree hemorrhoids were excluded.

Patients were divided randomly into 2 groups, group A (512) patients were treated by CO<sub>2</sub> laser hemorrhoidectomy, group B (512) patients were treated by conventional open hemorrhoidectomy.

All patients were examined by PR and proctoscopy. Only 40 patients required sigmoidoscopy to exclude the presence of rectal lesions resulting in secondary hemorrhoids.

Both procedures were done under general anesthesia; patients were placed in lithotomy position.

**CO<sub>2</sub> LASER HEMORRHOIDECTOMY:**

(COHERENT MEDICAL SYSTEM 450 CO<sub>2</sub> SURGICAL LASER XL)

Tissue forceps applied 2mm from the mucocutaneous junction to bring internal pile

into prominence, a hemostat applied to the internal hemorrhoid with slight traction, the pile is then mobilized from the lumen of the anal canal by cutting across the skin, and the cuts are made with laser energy which is delivered through a pen-shaped handle. A red light provided by low power laser, permits precise focusing of the therapeutic beam. The laser is aimed directly and perpendicularly to the surface of the pathology, the tip of the laser handle is kept approximately 5-15 cm away from tissues to allow perfect visualization. The pulse time is set as continues wave and the

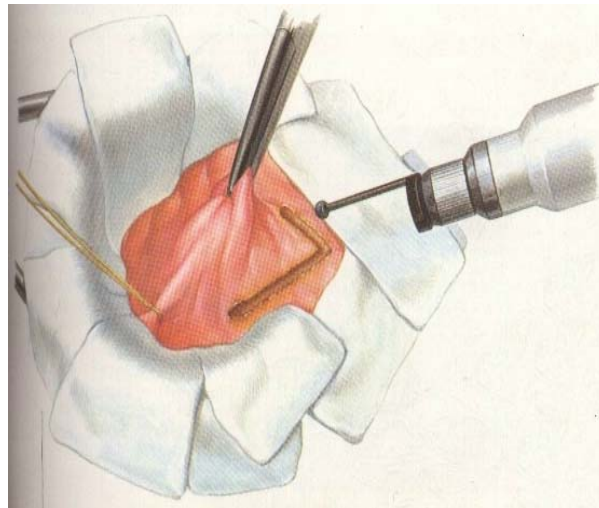
power is set at 20 to 30 watts. When the operator step on the pedal the laser red light and energy are shot out s close to the pile and made only through the skin. The pile now is pedunculated and attached only by its feeding vessels which are ligated with 2 0 absorbable suture, and then the pile is excised. Hemostasis is achieved by defocusing beam of laser and no anal pack was used. as demonstrated in photos 1,2 and diagram 1.

Patients were discharged within 4 to 12 hours, and were fallowed for 2 to 6 months for healing progress and complications.

***PHOTO 1: Showing laser machine (coherent medical system 450 co<sub>2</sub> surgical laser XL)***



*DIAGRAM 1 : The procedure of laser hemorrhoidectomy.*



*PHOTO 2 :Showing the bloodless field after laser hemorrhoidectomy.*

