

ORIGINAL PAPERS

DIODE LASER FOR TREATMENT OF SYMPTOMATIC HEMORRHOID: A SHORT TERM CLINICAL RESULT OF A MINI INVASIVE TREATMENT, AND ONE YEAR FOLLOW UP

*ABDOLHADI JAHANSHAHI¹, ESMAIL MASHHADIZADEH²,
MOHAMMAD-HOSSEIN SARMAST³*

Department of Surgery, Imam Khomeini Hospital, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran

Hemorrhoid is protrusion of plexus or blood vessels in the anal canal. The hemorrhoid may cause symptoms that are: bleeding, pain, prolaps, itching, soilage of feces, and psychologic discomfort. There are many methods for treatment of hemorrhoid like, medical therapy, cryo-therapy, rubber band ligation, sclerotherapy, laser, and surgery. All methods have some complication in postoperative period and recurrence.

The aim of the study was to evaluate Diode laser for treatment of hemorrhoid.

Material and methods. This study included patients who suffer from the hemorrhoid. Cases with fistula and fissure had been omitted. Patients with hemorrhoid in grade 2, 3, 4 and mixed were treated with diode laser. Follow up was done 1, 7, 14, 30, 90, and 360 days laser therapy.

Results. In this study, 341 patients with hemorrhoid treated with diode laser were included. Results of follow-up were as follows: need for analgesia in hospital stay and home was very low total complication was seen in 12 patient (3.51%), edema in 8 patient (2.34%), hemorrhage and abscess each of them in 2 patient (0.58%), stricture and recurrence was zero after one year.

Conclusions. All methods used for hemorrhoid treatment has advantages, disadvantages, and limitations. But treatment of hemorrhoid by Diode laser, which is done by skilled surgeon has several advantages over other treatments. This advantages include, less operation time, less pain and bleeding, allow quick healing of piles, no stricture, and minimal recurrence after operation.

Key words: diode laser, hemorrhoid, piles, bleeding

Hemorrhoidal plexus is normal anatomical part of anal canal. There are 3 hemorrhoid plexus in the right anterior, right posterior, left lateral. They are useful for anal canal physiology, especially on the time of defecation (1). They have two useful function. First for protection of anal canal mucosa, second for anal continence at rest by complete closure of anal canal. Hemorrhoid disease, describe to situation that causes symptom and troubles to the patient (2) The complains are, bleeding, nodule, soilage, itching, pain, pruritis, and symptomatic prolaps (2). Relaxation of fibro-

areolar connective tissues that fixed hemorrhoid to the anal canal make descending of hemorrhoid and results tortucity of hemorrhoidal plexus (2). There are three types of hemorrhoids: 1) internal, 2) external and 3) mixed.

Internal hemorrhoid originated from superior hemorrhoidal plexus its coverage is mucosa and is proximal to dentate line. internal hemorrhoid are divided to 4 degree. First degree bulge into the anal canal prolaps beyond the dentate line on straining. 2nd: degree prolaps through the anus and reduce spontaneous. 3rd: degree prolaps through the anal canal and

require manually reduction. 4th: degree bleed, prolaps but can not reduce and are at risk of strangulation. There are many treatments for hemorrhoids from medical to band ligation, electero-coagulation, stapled hemorrhoidpexy, infrared Laser, photocoagulation, sclerotherapy, doppler guided artery ligation and ultimately surgery (2, 3, 4). Due to high degree and number of hemorrhoids, treatments will be more complicate (5, 6).

Preservation of normal function of the anal canal (continence) and little skin Of the site and passage of feces containing mixed bacteria and disability of completed rest of it for healing complicate the treatment of hemorrhoid for that, its said: when you want to dishonor a surgeon send him or her to operate several patients with hemorrhoids There are many post operative complication that is terrible for patients and surgeons (2, 7).

There are many types of laser, like gas laser, chemical, laser- metal- vapor, solid, scotch semiconductor, and etc. there are two types of medical laser system contact and non contact. Contact systems work by sending laser light through a fiber or sapphire crystal tip. The tip absorbs the radiant energy and becomes hot. Direct contact between tissue and the heated tip cause conduction of heat energy from the tip to tissue, resulting the vaporization of the target cells. Diode laser is the direct contact laser. We are searching for a new technique for treatment of hemorrhoids that satisfy the patient. As there is limited research in the using of diode laser for treatment of hemorrhoid, we aim to use diode laser in our patients and evaluate side effect and recurrence for one year.

MATERIAL AND METHODS

This study was conducted in Arvand private hospital in Ahwaz city of Iran in 2010. Follow duration was 1 year till 2011. We excluded patients with hemorrhoid combined with fissure or fistula. Under general or spinal anesthesia, in lithotomy position, all cases underwent anorectal examination for another anorectal disease like cancer, fistula, prolaps, fissures and so on.

Diode 30 W laser with 980 nm wavelength was used for this procedure. Then make a pinhole by spot electero-cautary at anal verge

near the hemorrhoid base then push diode laser fiber from it into hemorrhoid submucosal, then start shooting laser. Before laser shooting we must wear anti laser glasses. each shoot has 15 watt energy 3 sec duration. for small hemorrhoids (one centimeter diameter) one shoot and for large hemorrhoids several shoots is needed. we see that the hemorrhoid shrink and is to be small. There after we withdraw the fiber from it. Then can repeat this arrange work for each hemorrhoid in another sites, so with this method all hemorrhoids treated in one stage. Patients discharged after 12-24 hrs. in the hospital stay need to analgesia was zero or very low. Follow up was done in day 1, 7, 14, 30, 90, 360 days after surgery. For assessment of pain, Verbal Description Scale was used.

Verbal description scale

- 0 = no pain,
- 1 = mild pain,
- 2 = discomforting,
- 3 = distressing,
- 4 = intense,
- 5 = excruciating.

RESULTS

Total patients were 368 cases but 27 patients excluded because of hemorrhoid was combined with fissure or fistula, so 341 patients evaluated. Of 341 cases, 219 (64.22%) patients was male and 122 (35.78%) was female ($p < 0.0001$). The mean operation time was about 10 minute (range 5-15). The most common age was between 20-60 year (tab. 1). The length of hospitalization after operation was about 18 hours.

The main complaint in patients was bleeding but itching, nodule, edema and pain was seen. Grade II and mixed type of hemorrhoid had high incidence. And grade III was in second position (tab. 2). Complication after diode laser was very low (12 patient =3.51%) that shown in tab. 3 and only edema in 8 patient (2.34%) hemorrhage in 2 patient (0.58%), abscess in 2 patient (0.58%) fistula, stricture and recurrence after one year was zero. Re-hospitalization was occurred in 2cases due to bleeding. Bleeding in two cases was treated by suturing.

Need for analgesia in post op. period was very low in hospital stay and in home.

Table 1. Age distribution among cases

Pleć / Sex	Age				
	1-20	21-40	41-61	61-80	81-100
Male 219	0	103 (47,03%)	84 (38,35%)	30 (13,70%)	2 (0,92%)
Female 122	0	71 (58,20%)	40 (32,79%)	10 (8,20%)	1 (0,81%)
Total 341	0	174 (51,02%)	124 (36,37%)	40 (11,73%)	3 (0,88%)

Table 2. Grades of hemorrhoid

Grade	II	III	IV	Mixed type	Total
Patients	127 (37,24%)	94 (27,56%)	2 (0,60%)	118 (34,60%)	341 (100%)

Table 3. Complications after treatment

Type of complication	n (%)
Edema	8 (66,67%)
Abscess	2 (16,67%)
Hemorrhage	2 (16,67%)
Fistula	0
Stricture	0
Recurrence	0
Total	12 (100%)

DISCUSSION

In our study, only 3.51% of cases showed complication after treatment by laser. Our complication rate was less than Wang et al. study (8). In the study by Wang et al. pain scores were lower in laser group (8). Small amounts of bleeding occurred in laser group but none of them required special homeostasis.

In another study on 332 cases with 980 nm diode laser, serious intra-operative complication did not occur. Abscess and subnodular fistula formation was noted in 0.6 of case (9). In our study, during 1 year of follow-up, no recurrence was seen. In Karahaliloğlu study, follow-up was 6 month – 3 year after surgery and recurrence was seen in 5.8% of cases (9).

All method for treatment of hemorrhoid has advantages, disadvantages, limitations, and complications. But there is evidence that laser has less complication. In the study by Giamundo et al., they concluded the hemorrhoid laser procedure was more effective than rubber band ligation in reducing complication and

improving quality of life following treatment. In their study, follow-up duration was < 1yr (10). Follow-up duration was the main limitation in our study and Giamundo et al. study (10).

There is evidence that using Indocyanine green (ICG) increase efficacy of diode laser (11), but we didn't use this adjunct therapy in the current surgery.

Because of some complication like, hemorrhage, recurrence, stricture especially in surgery, the diode laser is a good method for treatment of hemorrhoid because of less complication, low discomfort and pain after operation, simple, less time of operation, low hospital stay. We prefer laser diode in all patient with hemorrhoid especially patients with coagulopathy and disability, but may be expensive. With diode laser all hemorrhoid piles operated in one stage, but in surgery if hemorrhoids are extended the operation is done in two stages because of stricture formation after one year. Diode laser has no limitation in operation in all ages and all stages of hemorrhoids.

CONCLUSION

Diode laser is a safe method for treatment of hemorrhoid. More studies with longer follow-up period is recommended. In our study, the main limitation was follow-up duration that is about 1 year.

REFERENCES

1. Thomson WH: The nature of haemorrhoids. *Br J Surg* 1975; 62: 542-52.
2. Sneider EB, Maykel JA: Diagnosis and management of symptomatic hemorrhoids. *Surg Clin North Am* 2010; 90: 17-32, Table of Contents.
3. Pandini LC, Nahas SC, Nahas CS et al.: Surgical treatment of haemorrhoidal disease with CO₂ laser and Milligan-Morgan cold scalpel technique. *Colorectal Dis* 2006; 8: 592-95.
4. Plapler H, Hage R, Duarte J et al.: A new method for hemorrhoid surgery: intrahemorrhoidal diode laser, does it work? *Photomed Laser Surg* 2009; 27: 819-23.
5. Katdare MV, Ricciardi R: Anal stenosis. *Surg Clin North Am* 2010; 90: 137-45, Table of Contents.
6. Giamundo P, Cecchetti W, Esercizio L et al.: Doppler-guided hemorrhoidal laser procedure for the treatment of symptomatic hemorrhoids: experimental background and short-term clinical results of a new mini-invasive treatment. *Surg Endosc* 2011; 25: 1369-75.
7. Gao XH, Wang HT, Chen JG et al.: Rectal perforation after procedure for prolapse and hemorrhoids: possible causes. *Dis Colon Rectum* 2010; 53: 1439-45.
8. Wang D, Zhong KL, Chen JL et al.: Effect of diode laser coagulation treatment on grade III internal hemorrhoids). *Zhonghua Wei Chang Wai Ke Za Zhi* 2005; 8: 325-27.
9. Karahaliloğlu AF: Laser hemorrhoidoplasty (LHP): A new surgical procedure for the treatment of advanced hemorrhoidal illness. *Coloproctology* 2010; 32: 116-23. [Article in German]
10. Giamundo P, Salfi R, Geraci M et al.: The hemorrhoid laser procedure technique vs rubber band ligation: a randomized trial comparing 2 mini-invasive treatments for second- and third-degree hemorrhoids. *Dis Colon Rectum* 2011; 54: 693-98.
11. Usui Y: A new procedure of ICG enhanced diode laser therapy for hemorrhoids. *Journal of the Japan Society of Coloproctology*. 2003; 56: 815-18.

Received: 22.05.2012 r.

Address correspondence: Department of Surgery, Imam Khomeini Hospital,
Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran