



ADVANCED DIODE LASER IN PROCTOLOGY CASES : A SURGICAL REVIEW

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ABSTRACT

Lasers with ultrafast pulses have been developed to decrease the energy necessary to incise tissues and to decrease damage to surrounding tissues. Recent technological advances have made the treatment of these conditions easier. New techniques can be used as a dual procedure, when patients are suffering from a combination of rectal problems. Nowadays, it is easier, faster and safer to treat an anal fissure , fistula in ano, pilonidal sinus and hemorrhoids in one operation, with local anesthesia and sedation of the patient. Patients witness the benefits of one hospital admission, shorter operating time (<30 min for both), procedure ensuring them less pain, less costs and a shortened rehabilitation period. Experienced surgeons are able treat proctology problems . Lasers are safe, cause low pain and is minimally invasive surgical procedure with long-term good patient acceptance and satisfaction and is suited for routine work. The energy applied should be reduced to a minimum. Complication rates are largely comparable with those of other minimally invasive conventional methods. We have been using laser 1470nm advanced diode in various proctology cases in our set up and hereby sharing our experience combined with the results of previous studies for this review .

KEYWORDS : Laser 1470nm Advanced Diode , Proctology , Anal Fissure , Fistula In Ano, Pilonidal Sinus, Hemorrhoids

INTRODUCTION

Nowadays, it is easier, faster and safer to treat an anal fissure , fistula in ano, pilonidal sinus and hemorrhoids in one operation, with local anesthesia and sedation of the patient. Patients witness the benefits of one hospital admission, shorter operating time (<30 min for both), procedure ensuring them less pain, less costs and a shortened rehabilitation period .Since in our set up we are using lasers in anal fissure ,fistula in ano,pilonidal sinus and hemorrhoids.we divided the review predominantly in these four specialities and incorporated some studies on other uses of this particular laser as well .

DISCUSSION FISTULA IN ANO

Giamundo P et al did closure of fistula-in-ano with laser-FiLaC™ It was an effective novel sphincter-saving procedure for complex disease. Primary closure of the track is achieved using laser energy emitted by a radial fibre connected to a diode laser. The energy causes shrinkage of the tissue around the radial fibre with the aim being to close the track. The primary end-point was cure of the disease and evaluation of morbidity. Primary healing was observed in 25 (71.4%) patients. There were eight (23%) failures and two recurrences at 3 and 6 months after the operation. No patient reported incontinence postoperatively. The laser FiLaC™ procedure for fistula-in-ano is a safe, relatively simple, minimally invasive, sphincter-saving procedure with a high chance of success.[1]

Wilhelm A et al evaluated FiLaC™ laser for fistula-in-ano management in their five years of study. The aim of this study was to assess a cohort of anal fistulae managed with laser ablation plus definitive flap closure of the internal fistula opening over a long-term follow-up. Factors governing primary healing success and secondary healing success (i.e. success after one or two operations) were determined. Esercizio L et al who also studied long-term results and new operative strategies. They concluded that long-term follow-up after FiLaC™ seems to confirm the favorable short-term success rates reported for this procedure. Although sealing of chronic anal fistulas may be obtained with FiLaC™ in a single treatment, but the authors preferred Seton treatment before laser and seem to have favorable effects on healing.[2,3]

twenty cases was discussed by ELLISON GW et al. Sixteen of 20 (80%) dogs had resolved fistulas after one laser excision. Three of the four recurrences underwent additional laser treatments with successful results. The total number of laser procedures ranged from one to three with a mean of 1.2 procedures. Postoperatively, anal tone as judged by digital rectal examination was reduced in about 60% of the cases, but clinical evidence of fecal incontinence only occurred in four of 20 cases. This was managed effectively with diet modification. The tendency toward loss of anal tone or fecal incontinence depended on the severity of preexisting anal stenosis. The overall success rate using ND:YAG laser excision compared very favorably with previously reported studies of other methods of treatment for perianal fistulas in dogs.[4]

PILONIDAL SINUS

Chronic pilonidal disease is a common debilitating condition. It is a cause of considerable morbidity and social embarrassment. Pilonidal disease is common. Excessive hair growth in the natal cleft is thought to be a factor in initiating these sinuses. It is chronic and intermittent in nature and treatment can be difficult. Hair removal by shaving or use of creams is often advised as a compliment to surgical treatments. However, access to the natal cleft can be difficult. Oram Y et al did evaluation of 60 patients with pilonidal sinus treated with laser epilation after surgery. The charts were reviewed, and the patients were interviewed on the telephone about their post-laser period and recurrence. The laser parameters, patient history, and surgical details were recorded. The overall recurrence rate was 13.3%, after a mean follow-up period \pm standard error of the mean of 4.8 ± 0.3 years. Fifty percent of the recurrent cases had drainage and secondary intention before the laser epilation. Our results strongly suggest that laser hair removal after surgical interventions in pilonidal sinus disease decreases the risk of recurrence over the long term.[5]

Successful treatment of recurrent pilonidal sinus with laser epilation was also attempted by Landa N et al . Surgical treatment has a significant failure rate, and recurrence is common. Laser removal of hair in the natal cleft is an alternative to surgery. An alexandrite laser was mostly used, although, occasionally, an intense pulsed light device was used. The number of epilation treatments ranged from 3 to 11, performed at 6- to 8-week intervals. All patients experienced progressive resolution of the folliculitis with the laser epilation

Treatment of perianal fistulas with ND: YAG laser—results in

treatments. No more surgical treatments have been needed. The treatments were simple and quick, and there were no complications. Conclusion was that laser epilation of the natal cleft should be considered a first choice treatment for recurrent pilonidal disease. Preventive laser epilation of the natal cleft in patients with recurrent folliculitis could avoid future surgery.[6]

Odili J et al did laser depilation of the natal cleft. Laser removal of hair in the natal cleft is considered as an aid to healing the pilonidal sinus. Laser depilation in the natal cleft is by no means a cure for pilonidal disease. Removal of hair by this method represents an alternative and effective method of hair removal and, although long lasting, is only temporary. However, it allows the sinuses to heal rapidly. It is relatively safe, and simple to teach, with few complications. It should thus be considered as an aid to healing the problem pilonidal sinus.[7]

Conroy FJ et al did a study on laser depilation and hygiene and preventing recurrent pilonidal sinus disease. They did a review of 14 patients who underwent laser hair depilation in the natal cleft following pilonidal sinus surgery. The majority of patients had recurrent disease and had undergone numerous surgical procedures (range 1–5, mean 2.07) All patients were given advice regarding meticulous personal hygiene at the time of consultation. Laser hair depilation is a useful adjunct in preventing the recurrence of pilonidal sinus disease and should be offered routinely to all patients. This coupled with patient education regarding personal hygiene reduces the risk of developing recurrent pilonidal sinus disease.[8]

Schulze SM and Ghnam WM et al did treatment of pilonidal disease with laser epilation. Laser hair removal was adjunct to surgery for pilonidal sinus. This prospective randomized study compared permanent laser hair removal following the excision of pilonidal disease with conventional methods for hair removal. Both authors advocate the use of laser epilation after surgery for pilonidal sinus as it decreases the chance of recurrence but larger studies with long-term follow-up are still needed to approve this conclusion.[9,10]

LASER HEMORRHOIDOPLASTY PROCEDURE VS OPEN SURGICAL HEMORRHOIDECTOMY

Haemorrhoidectomy has proven long-term efficacy in the treatment of haemorrhoids, albeit at the price of increased pain and complications compared with other modalities. Laser haemorrhoidoplasty (LHP) with the 1470 nm diode laser in minimally invasive surgery for advanced haemorrhoid disease has been studied with respect to clinical variables, such as pain and complications, and intraoperative characteristics such as mucopexia, number of treated knots and energy consumed per patient. The study also included patient satisfaction, symptom relevance and cost effectiveness. This study reviews the literature and describes best and recent practices in the treatment of haemorrhoids. Maloku H et al compared laser hemorrhoidoplasty procedure vs open surgical hemorrhoidectomy by a trial. It compared 2 treatments for hemorrhoids of third and fourth degree. Patients with symptomatic grade III or grade IV hemorrhoids with minimal or complete mucosal prolapse were eligible for the study: 20 patients treated with the laser hemorrhoidoplasty, and 20 patients—with open surgery hemorrhoidectomy. Operative time and postoperative pain with visual analog scale, were evaluated. There was a statistically significant difference between the two groups regarding the early postoperative period: 1 week, 2 weeks, 3 weeks and 1 month after respective procedure ($p < 0.01$). The procedure time for LHP was 15.94 min vs. 26.76 min for open surgery ($p < 0.01$). The laser hemorrhoidoplasty procedure was more effective than open surgical hemorrhoidectomy. Postoperative pain and

duration time are only two indicators for this difference between these procedures.[11]

Wang JY et al explored the role of lasers in hemorrhoidectomy. Eighty-eight patients who received treatment for hemorrhoids were randomized into two groups. Group A received the Nd-YAG laser phototherapy for internal hemorrhoid combined with the CO₂ laser for external hemorrhoid. Group B was treated with closed Ferguson hemorrhoidectomy. The need of narcotic injections for pain relief was 11 percent in group A vs. 56 percent in group B ($P < 0.001$). The incidence of postoperative urinary retention was 7 percent in group A, vs. 39 percent in group B ($P < 0.05$). No enema was required postoperatively in group A, vs. 9 percent in group B; 84 percent of the patients in group A were discharged on the second postoperative day, vs. 83 percent of the patients in group B discharged on the fifth postoperative day. The cost was 20 percent less in the former group. The overall complications in both groups were insignificant in difference, except prolonged wound healing in group A was noted. One year follow-up showed satisfactory results. To conclude, Laser treatment is considered one of the alternatives to conventional treatment, but the surgeon needs to be aware of laser hazards.[12]

Ivanov D et al did Harmonic scalpel® hemorrhoidectomy, a painless procedure, whereas Cheetham MJ did Evidence-based practice in haemorrhoidectomy. Surrogate measures such as post-operative pain scores and changes in anorectal physiology were commonly assessed in preference to efficacy in symptom reduction. Haemorrhoidectomy may be safely performed under general, local or regional anaesthesia according to patient fitness and local practice. Results of randomized controlled trials indicate that there open and closed techniques of haemorrhoidectomy are equivalent. There is no evidence to support the practice of laser haemorrhoidectomy. Diathermy haemorrhoidectomy achieves good haemostasis and permits an anal dressing to be omitted, but is not superior to conventional techniques. The use of preoperative lactulose and post-operative oral metronidazole is supported by randomized controlled trials. Haemorrhoidectomy is currently the most effective treatment for prolapsing haemorrhoids. There is little evidence to support the use of one surgical technique over another. With attention to detail and adjuncts to reduce post-operative pain, haemorrhoidectomy may be performed as day surgery.[13,14]

Weyand G et al did a Cohort Study with 497 Patients. They did laser hemorrhoidoplasty with 1470 nm Diode Laser in the Treatment of Second to Fourth Degree Hemorrhoidal Disease. Long-term symptom relevance was 86%, and patient satisfaction 91%. Complications occurred in 49 patients (9.9%): bleeding 1.8%, infection 1%, urine retention, oedema/thrombosis/prolapse 6.6%. 8.8% of patients suffered a relapse within 6 months. There were significant differences in pain on the day of the operation, and the parameters mucopexia, 3 treated segments and energy level > 500 J ($p < 0.05$). To conclude, LHP is a safe, low pain and minimally invasive surgical procedure with long-term good patient acceptance and satisfaction and is suited for routine work. The energy applied should be reduced to a minimum. Complication rates are largely comparable with those of other minimally invasive conventional methods.[15]

OTHER USES OF LASER

[A]VARICOSE VEINS Endovenous laser treatment of varicose perforating veins with 1470 nm diode laser using the radial fiber slim is effective and safe with low recanalization rates during 1-month follow-up.[16,17]

[B]LASERS IN BPH Several diode laser systems were introduced in recent years for the minimal-invasive surgical

therapy of benign prostate enlargement. [18,19]

[C] cold and warm tumescent anesthesia for pain perception [20]

[D] tonsillectomy: 1,470 nm laser application provides comparable tissue ablation effects with less intraoperative bleeding and shorter operation time. [21]

[E] cervico-urethral obstructions [22]

CONCLUSION

Laser is a safe, low pain and minimally invasive surgical procedure with long-term good patient acceptance and satisfaction and is suited for routine work. The energy applied should be reduced to a minimum. Complication rates are largely comparable with those of other minimally invasive conventional methods

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WHAT THIS STUDY ADD TO EXISTING KNOWLEDGE :

Laser is a safe, low pain and minimally invasive surgical procedure with long-term good patient acceptance and satisfaction and is suited for routine work. The energy applied should be reduced to a minimum.

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