FIGURE 3: MRI SHOWING AN ENHANCED HETEROGENEOUS MASS AT SHAFT OF THE FEMUR WITH SOFT TISSUE EXTENSION OCCUPYING ANTERO- MEDIAL AND LATERAL COMPARTMENT.

Laser Tonsillectomy in Sudanese patients

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Abstract

Background: Laser is an *acronym* of light Amplification by Stimulated Emission of Radiation. Laser light is known to have a high intensity, collimated beam and monochromaticity. Due to these special properties, laser found wide range of applications particularly in medicine including diagnostic and therapeutic. Laser has been used in ENT clinically since late 1970. In the Sudan, Laser is introduced recently in medicine including the ENT, Head and Neck surgery with various operations mainly larynx, oral cavity, neck and tonsillectomy.

Research Objectives: This work aims to investigate the effectiveness of using laser in tonsillectomy, to sort out the possible complications in laser tonsillectomy and to find out ability of oral intake fallowing laser tonsillectomy.

Research methodology: Thirteen patients have been chosen to have laser tonsillectomy. Inclusions criteria, all patients were presented to Aldoha ENT Specialized Hospital with chronic tonsillitis, with indication for surgery. Exclusions criteria; all patients refused laser tonsillectomy, or patients with concomitant complications.

Results: The sample size included in this work was thirteen patients from both sexes (4 male and 9 female) with wide range of ages from 5 to 60 years. Tonsillectomy was performed for all patients (100%) using CW diode laser with wavelength of 980 nm, 30 watts. The laser tonsillectomy was done for all patients under general agnathia. Bilateral tonsillectomy was done for eleven patients (84.6%), bilateral tonsillectomy with uvulectomy (UPPP) were done for two patients (15.4%) while a unilateral tonsillectomy were done for only one patients (7.7%). The obtained results showed that no intra-operative nor post-operative complications apart of slight intra-operative bleeding in 12 patients (92.3%) and only one patient with moderately bleeding, no sever one. The bleeding was mostly from the left tonsil (69.2%). No post-operative infection was detected. All patients (100%) showed good healing in the third and sixth weeks.

Conclusions: It can be concluded that the of using of laser in tonsillectomy is played an important role in reducing operating time, pain and bleeding during intra operative and post-operative, Moreover, using of laser in tonsillectomy can also accelerate healing and minimizing post-operative complications.

Recommendation: From this study we recommend that encourage laser tonsillectomy. Do further studies with a larger number to insure and obtain acquired results.

Keywords: Tonsillectomy, Laser, ENT, Surgery

Introduction

Laser is an *acronym* of **li**ght amplification by **S**timulated **E**mission of **R**adiation. Laser light have special properties compare to the ordinary light which is intense, collimated and monochromatic. Due to these fascinating properties, laser light is known to have small spot with extremely high energy when focused by a lens or concave mirror (Richa Sharma and Vibhu Sharma, 2010). As the result, laser has found

wide range of applications in all most all fields of research including for example, industry, military, science, speroscopy, aircraft, medicine and etc ., Recently, laser has intensively used in medicine applications including diagnostic and therapeutic. In particular, laser has been used in **ENT** clinically since late 1970s for different type of surgery such as stapedotomy, tympanoplasty, in the ear, oral lesions and tonsillectomy, as well as the ENT endoscopy and microsurgery in the larynx and bronchial tree (Ramalingam, K.K et al, 2014, Crown, D. L., and Hibbert, J. 1997, Nazik, E.A. and Nafie, A. 2010). Actually, there are essential conditions for laser use in any specialty that should be satisfied to provide the best results (Stanley, M. et al, 2014). These are, understanding of the laser characteristics, the limitation of the wavelength, interaction with tissues, and mode of transmission, delivery system (ex., optic, contact and non-contact modes) and setting (ex., power, repetition rate continuous versus pulse modes). Different types of lasers have been used in ENT depends on different applications. For examples, the Argon laser is mainly used in the middle ear surgery such as stapedectomy, tympanoplasty, polps and tonsillectomy particularly for patients with bleeding tendency as hemophilia. The carbon dioxide (CO_2) laser has been used widely in the oral cavity as resection of pre- cancerous lesions such as leukoplakia. Moreover, CO_2 laser is also used to free the tie tongue and removal of the nasal polyps, nasal adhesions (synechia). The Nd: YAG and CO_2 lasers were used in bronchial tree, vocal cord polyps, granulomas and tumor's (Casro, D.J., Saxton, RE. and Soudant, J. 1996, Dixon, J.A. 1987, Crown, D. L., and Hibbert, J. 1997).

Tonsillitis is an inflammation process of the tonsils which can be occurred at any age. The acute tonsillitis occurs more frequent in children and adolescence, and will be more sever, painful if occurs in adult, and with a long course of treatment. Acute tonsillitis can be due to viral infection, followed by bacterial affection. The main treatment of acute attached, is bed rest, analgesia, mouth gargle and antibiotic medication if the patient has fever with leukocytosis (in bacterial infection) (Ramalingam, K.K et al, 2014, Qian, P et al, 2008). In chronic tonsillitis, with high frequencies more than 4-6 attaches per year the ultimate solution is surgical removal (tonsillectomy). There are different modalities of tonsillectomy namely the classical removal, bipolar resection, crayon-surgery and recently laser tonsillectomy. Laser tonsillectomy is a rapid save painless, with minimum blood loss which can be performed under local or general anasethia . There are many indications for tonsillectomy which are; recurrence of tonsillitis, recurrent attacks of peritosillar abscesses (Quinsy), asymmetrical tonsils (suspicion of malignancy) etc….. Using the laser light beam to dissect or remove a part or tonsil

completely is called Laser tonsillectomy. Many indications for laser tonsillectomy, as chronic tonsillitis, tonsillar stone (tonsillarliths). The enlargement tonsils are a common cause of snoring in children and adult and sleeping aponae (Stanley, M et al, 2014, Matin, MA. and Alamgir, C. M., 2012, Riccardo, D., 2004, Yeon, K. C et al, 1996, Azhar, M.S. and Iand, B., 1998).

In the Sudan, Laser is introduced recently in medicine including the ENT, Head and Neck surgery with various operations mainly larynx, oral cavity, neck and tonsillectomy (Nazik, E.A. and Nafie, A, 2010). Therefore, this work is aim to investigate the using of laser in tonsillectomy to encourage the prospective researchers to be used in future.

Materials and Methods

This work has been done at Aldoha ENT Specialized Hospital during the period from December 2017 to March 2018. Thirteen patients have been chosen to do laser tonsillectomy. All patients presented to Aldoha ENT Specialized Hospital with chronic tonsillitis, for surgery. All patients with chronic tonsillitis accept or prefer laser tonsillectomy. Patients from both sexes and wide range of ages with chronic tonsillitis were included. All patients and their relatives were asked if they have knowledge about laser surgery. Most of them (61.5%) they did not know laser. Inspire of that 92.3% they prefer to do laser tonsillectomy.

Tonsillectomy has been done using CW diode laser (class four) with wavelength of 980 nm, power of 30 watt. The laser tonsillectomy was done for all patients under general agnathia.

Results and discussion

This work has been done at Aldoha ENT Specialized Hospital during the period from the first of December 2017 to end of March 2018. The sample size included in this work was thirteen patients from both sexes (4 males and 9 females) (see Fig.1B) with wide range of ages from 5 to 60 years old (with the mean of 16 to 55 years old) (see Fig.1A).

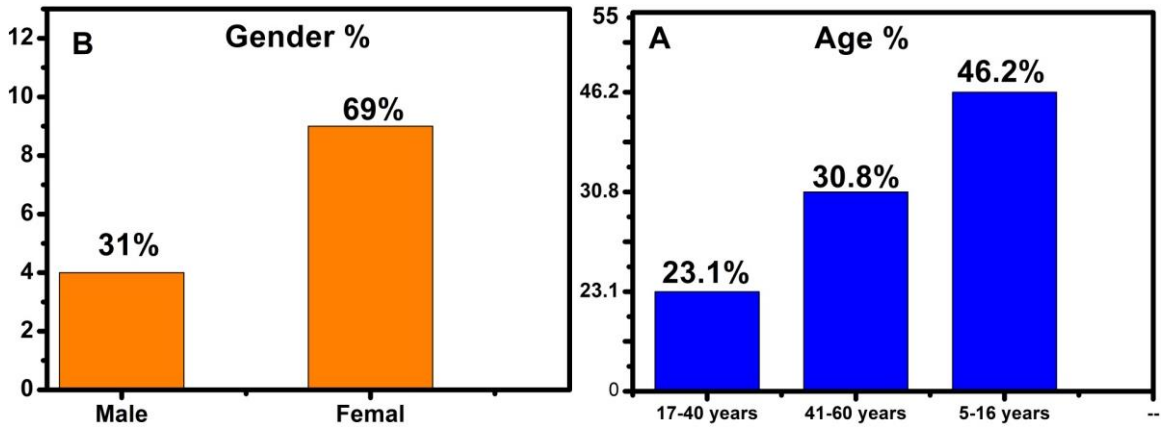

Fig. 1 Shows (A) age and (B) gender ratio of patients included in this work

These thirteen patients included eleven Sudanese patients (84.6%), eight of them (61.6%) from Khartoum state (Khartoum), two (15.4 %) from Aljazeera state (Wad Madani) and one (7.7%) from West Kordofan state (Babanosa) while the other two (15.4%) were foreigner form South Sudan (Juba, Umgammana). The most common presenting symptoms in patients were shown in figure 2.

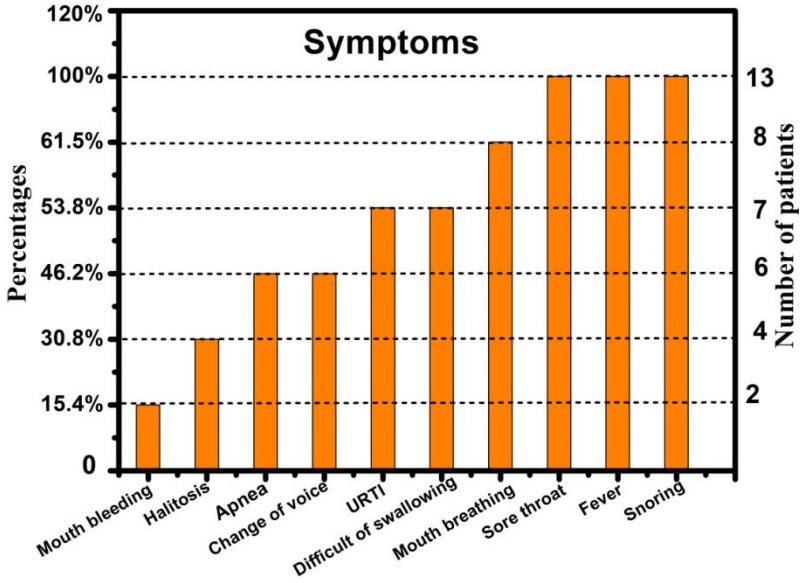

Fig. 2 shows the symptoms of the patients prone to laser tonsillectomy

As can be seen from figure 2, that the symptoms such as sore throat, snoring and fever were visible to all patients (100%), eight patients with mouth breathing (61.5%), URTI & difficulty in swallowing seven patents (53.8%), apnea and change of voice six patients (46.2%), halitosis four patients (30.8%) while

only two patients presented with mouth bleeding (15.7%). It is very important to note that the most presented signs were hypertrophy of the tonsils bilaterally which were appeared in eleven patients (84.6%) while the right side is presented only in two patients (15.44%). In addition, the color of the tonsils was red and congested in eleven patients (84.6%) and pale in two patients (15.4%) while halitosis was detected in only one patient (7.7%).

Tonsillectomy was performed for all patients (100%) using CW diode laser with wavelength of 980 nm, 30 watt. It is important to note that the laser tonsillectomy was done for all patients under general aneasthia. Bilateral tonsillectomy was done for eleven patients (84.6%), bilateral tonsillectomy with uvulectomy (UPPP) were done for two patients (15.4%) while a unilateral tonsillectomy was done for only one patients (7.7%).

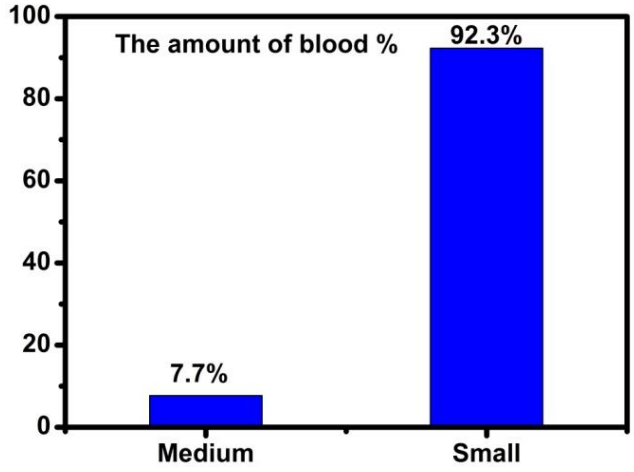

Fig.3 shows the amount of blood loss in patients during laser tonsillectomy.

Of interest is that no intra- operative nor post-operative complications apart of slight intra-operative bleeding in twelve patients (92.3%) and only one patient with moderately bleeding (see figure 3), no sever one. The bleeding was mostly from the left tonsil (69.2%). The post-operative pain for all patients was shown in figure 4.

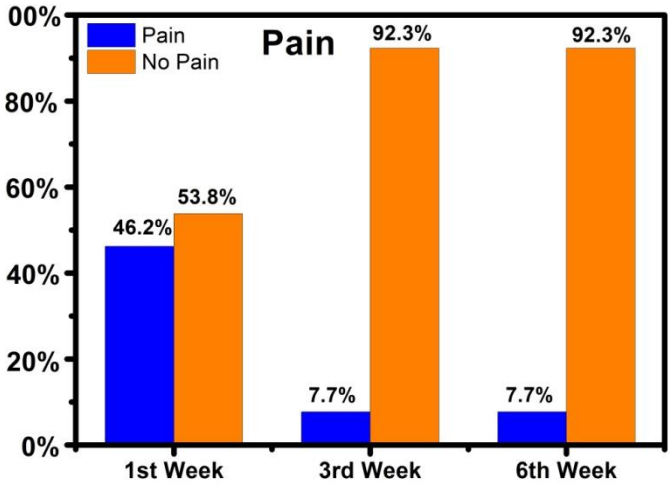

Fig. 4 shows the post operative pain in patients prone to laser tonsillectomy.

As can be seen from figure 4 that in the post-operative follow up in the first week, no pain was detected for seven patients (53.8%), slight pain was detected for five patients (38.5%) while moderate pain was detected only for one patients (7.7%). In both third week and sixth week, no pain was detected for twelve patients (92.3%) while only one patient showed slight pain (7.7%). There was also no post-operative bleeding through the study period was detected. The post- operative eating was shown in table 1.

Table 1 post operative oral intake (Eating)

			Eating		Total
			Yes	No	
Weeks	1st Week	Count	10	3	13
		% within Weeks	76.9%	23.1%	100.0%
	3rd Week	Count	13	0	13
		% within Weeks	100.0%	0.0%	100.0%
	6th Week	Count	13	0	13
		% within Weeks	100.0%	0.0%	100.0%
Total		Count	36	3	39
		% within Weeks	92.3%	7.7%	100.0%

Table1 show that the post- operative eating, in the first week was good in ten patients (76.9%) and painful swallowing in only three patients (23.1%). In the third and sixth week, all patients (100%) showed good eating. Table 2 shows the post- operative infections.

Table 2 post operative infections

			Infection	Total
			No	
Weeks	1st Week	Count	13	13
		% within Weeks	100.0%	100.0%
	3rd Week	Count	13	13
		% within Weeks	100.0%	100.0%
	6th Week	Count	13	13
		% within Weeks	100.0%	100.0%
Total		Count	39	39
		% within Weeks	100.0%	100.0%

As can be seen from table 2 there was no post- operative infections was detected for all patients during study period. Figure 5 shows the post operative healing.

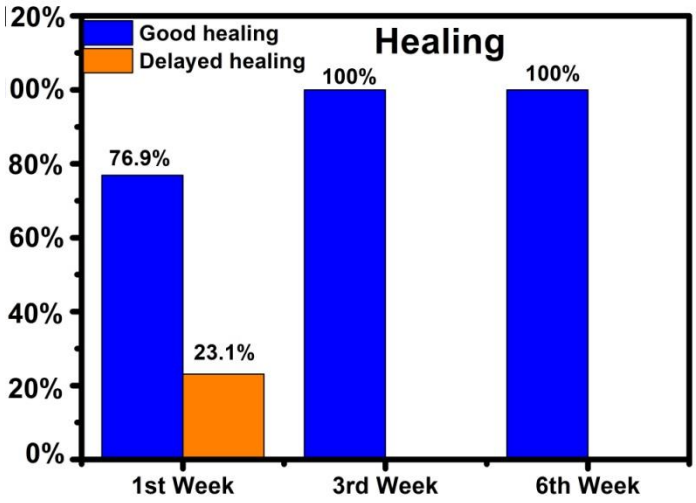

Fig. 5 shows the post operative healing.

Figure 5 showed that in the first week, the post operating healing was good in ten patients (76.9%) and delayed healing is detected only in three patients (23.1%). The third and sixth week showed good healing for all patients (100%).

According to above result, it can be concluded that the laser tonsillectomy has a good intra operative outcome, saving time and less blood loss. Moreover, the laser tonsillectomy also showed a nice post-operative condition, decrease pain, early oral intake, no infection and good and rapid healing in agreement with the international research's results.

Conclusion

In this work thirteen patients were subjected to tonsil surgery using CW diode laser with the wavelength of 980 nm and power of 30 watt. Compare to traditional tonsillar l surgery, it found that the using of laser in tonsillectomy is played an important role in reducing operating time, pain and bleeding during intra operative and post operative, Moreover, using of laser in tonsillectomy can also accelerate healing and minimizing post operative complications. Therefore, it can be concluded that using of laser in tonsillectomy is safe and effective.

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