

LASER Lipolysis at 1060 nm: A Promising Tool for Non Surgical and Non-Invasive Fat Reduction

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Abstract

Obesity is state of excess of adipose tissue mass. Obesity is global cause of concern. Lots of medical conditions are linked with Obesity, like insulin resistance, glucose intolerance, diabetes mellitus, hypertension, dyslipidaemia, sleep apnoea, arthritis, hyperuricemia, gall bladder disease, PCOD, coronary artery disease and certain types of cancer. Non-invasive and nonsurgical methods are gaining lot of reputation and interest for fat loss and to combat obesity. The study was conducted at Arth Skin and Fitness Centre, Udaipur and machines of Woxmen Company were used. CALYSTA - Woxmen for LASER lipolysis was used, while for tightening, help of Unipolar and Bipolar Radiofrequency technology was taken.

30 patients were selected between age of 24 to 64 years having Body Mass Index of 27 or above. 20 patients were Male, and 10 patients were Female. All the patients showed good response in terms of reduction of abdominal girth. The average reduction in abdominal girth was 9.9 cms which is approximately 4 inches in single session within 6 weeks of therapy. The highest decrease was 16.5 cms and lowest was 4 cms. Male and female patients responded almost equally to the LASER and Radiofrequency technology.

LASER lipolysis at 1060 nm coupled with radiofrequency tightening is promising nonsurgical tool for fat reduction around abdominal areas.

Keywords: Obesity, Fat Reduction, Nonsurgical Fat Reduction, Woxmen Calysta, 1060 nm LASER, LASER lipolysis

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Introduction

Obesity is simply defined as a state of excess adipose tissue mass. It is not necessarily linked to increased body weight because many lean but very muscular individuals may be overweight without having increased adiposity[1]. The prevalence rate is quite high. Worldwide more than 1.9 billion adults are overweight and 650 million are obese. Approximately 2.8 million deaths are reported as a result of being overweight or obese[2]. Obesity is related to a number of medical comorbid

conditions. These include: insulin resistance, glucose intolerance, diabetes mellitus, hypertension, dyslipidemia, sleep apnoea, arthritis, hyperuricemia, gall bladder disease, and certain types of cancer. The obesity is independently associated with coronary artery disease, heart failure, cardiac arrhythmia, stroke, and menstrual irregularities[3].

Surgery was the mainstay for fat reduction in terms of liposuction and bariatric surgery for obesity Grade II and Grade III cases.

However, with the invent of non-invasive and non-surgical methods a lot of attention is drawn towards these methods. Cryolipolysis was introduced which was causing the fat cell death at minus 10 degree centigrade. In comparison to this, LASER Lipolysis is introduced which causes fat cell destruction between 45 to 47 degree centigrade with the help of 1060 nm wavelength LASER and fat is the primary target at this wavelength[4]. To avoid damage to epidermal and dermal layer due to melanin interference, contact cooling is enabled in equipment. LASER Lipolysis from CALYSTA - Woxmen was used, which is 1060 nm having primary affinity for adipocytes[5]. It is based on the principle that if fat is subjected to higher temperature around 45 degrees Celsius or above then fat cells suffer permanent damage and die. The dead cells are scavenged by the immune system of body.

Materials and Methods:

The study was conducted at Arth Skin and Fitness Centre, Udaipur and machines of Woxmen Company were used. CALYSTA for LASER lipolysis was used, while for tightening, help of Unipolar and Bipolar Radiofrequency technology was taken⁵.

30 patients were selected between age of 24 to 64 years having Body Mass Index of 27 or above. 20 patients were Male, and 10 patients were Female.

Three prominent sites were selected on Abdomen:

- 2 to 3 inches above Navel
- At the level of Navel
- 2 to 3 inches below Navel

The three measurements were summed pre procedure and after that LASER Lipolysis was given as per protocol given by the company. Protocols were varied depending on patient tolerance and skin response like erythema.

The fat cells when lost may lead to sagging of skin because of loss of subcutaneous fat between skin and muscle. To avoid the sagging or loosening of skin, radiofrequency tightening of the skin was done after 4 weeks of LASER Lipolysis.

After 6 weeks the final measurement was taken on the prominent three sites as it was done on first day before treatment. Post measurement was summed from all the three sites.

Preprocedural summed up data was compared to postprocedural data summed up data to compare the results.

To avoid any confounding factors Daily Energy Expenditure of Calories diet was calculated and advised with mild to moderate level of physical activity.

Results:

Table 1: Data of 30 Patients Showing Cumulative and Point Wise Reduction in Abdominal Girth

S.No.	Age	Sex	Pre-Procedure Measurement			Pre-Procedure Total	Post Procedure Measurement			Post Procedure Total	Pre & Post Procedure Difference
			Above Navel	Navel	Below Navel		Total	Above Navel	Navel		
1	24	Male	93	100	104	297	91.5	99	102.5	293	4
2	44	Male	109	113.5	106	328.5	108	111	105	324	4.5
3	35	Male	111	112	114	337	109	111	112	332	5
4	45	Male	108.6	111	108.5	328.1	106	109	108	323	5.1
5	42	Male	86.2	91.7	90.5	268.4	85	88.5	89	262.5	5.9
6	35	Female	86.3	91.4	88.9	266.6	84.3	86.6	88.6	259.5	7.1
7	35	Female	94	97	99	290	92	94.5	96	282.5	7.5
8	49	Male	108	112	112	332	106	109	109.5	324.5	7.5

9	54	Male	89.5	93.5	93	276	86.5	91.5	90	268	8
10	48	Female	99	109	107	315	96	106	105	307	8
11	33	Male	110	112.5	110	332.5	107	110	107.5	324.5	8
12	64	Female	110	118.5	121.5	350	107.5	115.5	118.5	341.5	8.5
13	47	Female	97	103.5	105.5	306	92	101	104.5	297.5	8.5
14	30	Male	93	96.5	94	283.5	88	93.5	93	274.5	9
15	46	Male	125.5	129	124	378.5	121	126	122	369	9.5
16	45	Male	99.5	106	97.5	303	96.5	101.5	95	293	10
17	47	Female	122.5	123	121	366.5	117	119	119.5	355.5	11
18	32	Female	85	97	100	282	81	91	99	271	11
19	54	Male	117.5	122	113	352.5	115.5	118.5	107	341	11.5
20	55	Male	108.5	112.5	107.5	328.5	103.5	109	104.5	317	11.5
21	40	Male	122	131	128	381	117.5	128	124	369.5	11.5
22	39	Female	94	99.5	104	297.5	90	96	100	286	11.5
23	41	Male	93	102	104	299	90.5	98	99	287.5	11.5
24	40	Male	97.5	102.5	98	298	93	96.5	95.5	285	13
25	55	Male	105	112	110	327	100	106.5	106.5	313	14
26	38	Male	99.5	105	105	309.5	97	99	99.5	295.5	14
27	31	Male	117	129	126	372	110.5	123	124	357.5	14.5
28	31	Female	84.5	97	104	285.5	80	91	100	271	14.5
29	40	Female	94	107	112	313	90	101.5	106	297.5	15.5
30	26	Male	118.5	133	122	373.5	110.5	126	120.5	357	16.5
										AVERAGE	9.9

As shown in table 1, All the patients showed reduction in Abdominal circumference. The average reduction in 30 patients was 9.9 cms which is approximately 4 inches cumulative of all the three points.

The highest decrease was 16.5 cms and lowest was 4 cms.

Table 2: Data of 10 Female Patients Showing Cumulative and Point Wise Reduction in Abdominal Girth

S.No.	Age	Sex	Pre-Procedure Measurement			Pre-Procedure Total	Post Procedure Measurement			Post Procedure Total	Pre & Post Procedure Difference
			Above Navel	Navel	Below Navel		Above Navel	Navel	Below Navel		
1	35	Female	86.3	91.4	88.9	266.6	84.3	86.6	88.6	259.5	7.1
2	35	Female	94	97	99	290	92	94.5	96	282.5	7.5
3	48	Female	99	109	107	315	96	106	105	307	8
4	64	Female	110	118.5	121.5	350	107.5	115.5	118.5	341.5	8.5
5	47	Female	97	103.5	105.5	306	92	101	104.5	297.5	8.5
6	47	Female	122.5	123	121	366.5	117	119	119.5	355.5	11
7	32	Female	85	97	100	282	81	91	99	271	11
8	39	Female	94	99.5	104	297.5	90	96	100	286	11.5
9	31	Female	84.5	97	104	285.5	80	91	100	271	14.5
10	40	Female	94	107	112	313	90	101.5	106	297.5	15.5
										AVERAGE	10.3

As shown in Table 2, the average reduction in 10 female patients is 10.3 Cms. In female clients the lowest was 7.1 cms and highest reduction was 15.5 cms.

Table 3: Data of 20 Male Patients Showing Cumulative and Point Wise Reduction in Abdominal Girth

S.No.	Age	Sex	Pre-Procedure Measurement			Pre-Procedure Total	Post Procedure Measurement			Post Procedure Total	Pre & Post Procedure Difference
			Above Navel	Navel	Below Navel		Above Navel	Navel	Below Navel		
1	24	Male	93	100	104	297	91.5	99	102.5	293	4
2	44	Male	109	113.5	106	328.5	108	111	105	324	4.5
3	35	Male	111	112	114	337	109	111	112	332	5
4	45	Male	108.6	111	108.5	328.1	106	109	108	323	5.1
5	42	Male	86.2	91.7	90.5	268.4	85	88.5	89	262.5	5.9
6	49	Male	108	112	112	332	106	109	109.5	324.5	7.5
7	54	Male	89.5	93.5	93	276	86.5	91.5	90	268	8
8	33	Male	110	112.5	110	332.5	107	110	107.5	324.5	8
9	30	Male	93	96.5	94	283.5	88	93.5	93	274.5	9
19	46	Male	125.5	129	124	378.5	121	126	122	369	9.5
11	45	Male	99.5	106	97.5	303	96.5	101.5	95	293	10
12	54	Male	117.5	122	113	352.5	115.5	118.5	107	341	11.5
13	55	Male	108.5	112.5	107.5	328.5	103.5	109	104.5	317	11.5
14	40	Male	122	131	128	381	117.5	128	124	369.5	11.5
15	41	Male	93	102	104	299	90.5	98	99	287.5	11.5
16	40	Male	97.5	102.5	98	298	93	96.5	95.5	285	13
17	55	Male	105	112	110	327	100	106.5	106.5	313	14
18	38	Male	99.5	105	105	309.5	97	99	99.5	295.5	14
19	31	Male	117	129	126	372	110.5	123	124	357.5	14.5
20	26	Male	118.5	133	122	373.5	110.5	126	120.5	357	16.5
										AVERAGE	9.7

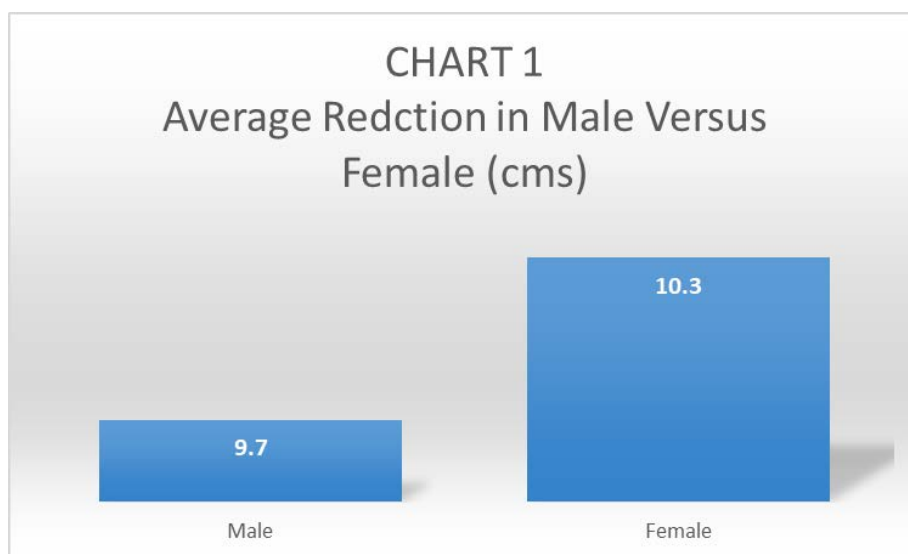
As shown in Table 3, the average reduction in 20 male patients is 9.7 cms. The highest value of reduction was 16.5 cms and lowest was 4 cms.

Discussion:

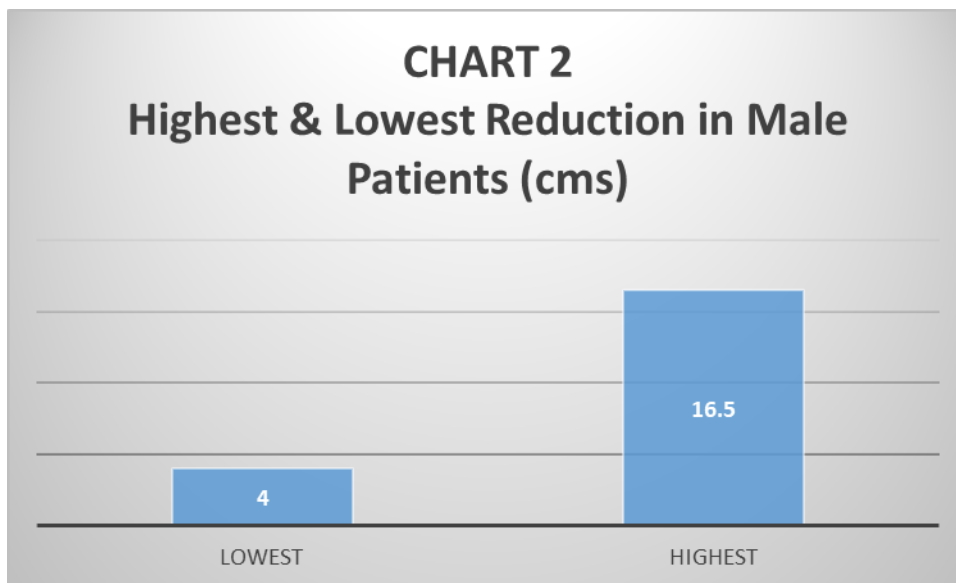
It is well known fact that when someone is having fat deposition then over the period of time skin laxity and looseness develops. Thus, it becomes imperative that both fat

loss through LASER Lipolysis and tightening with collagen remodelling by the scientific application of Unipolar and Bipolar Technology is done.

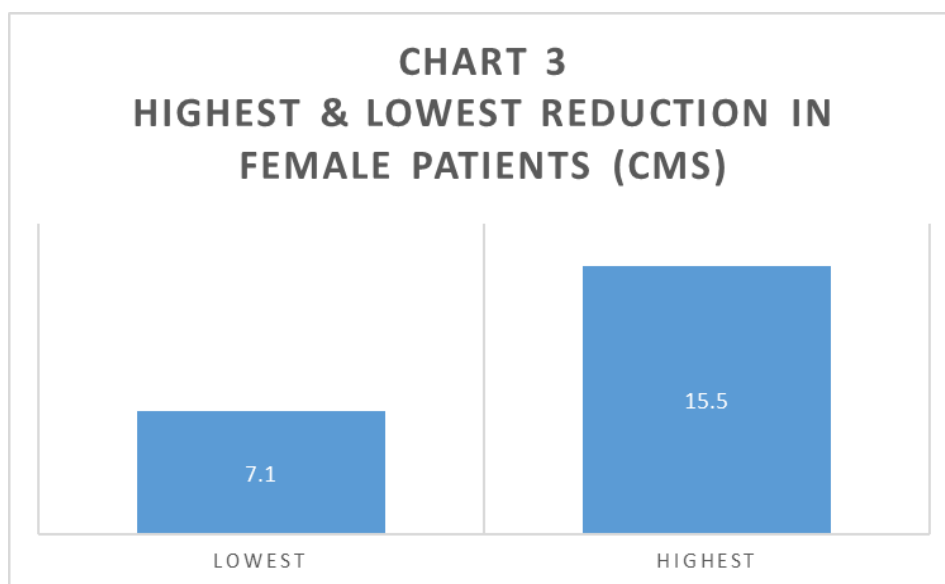
In this study there is not much significant difference is observed between male and female patients, average reduction of belly reduction as shown in CHART 1, both are close to 10 cms.



However, there is huge difference observed between highest and lowest reduction in both the genders. As shown in CHART 2, the highest reduction in males was 16.5 cms and lowest being 4 cms.



in female patients the range of highest to lowest was 15.5 cms to 7.1 cms as observed in CHART 3.



The range of reduction in male patients was much higher. Around 4-time variation occurred to calculate it from 4 to 16.5 cms but in female the variation was only around 2 times to calculate it from 7.1 to 15.5 cms. No significant cause can be attributed to such variance although one of the reasons may be lesser number of female patients registered in this study (10 only) versus 20 male patients registered so variance is much

observed in male patients in comparison to female patients.

Three prominent points were taken over abdomen to observe visible aesthetic difference for patients. In many cases different point measurements showed different values but seems of no significance because different patients have difference in fat and laxity at variable

points, so reduction variance is observed accordingly.

Conclusion:

Obesity is state of excess of adipose tissue mass. Nonsurgical and Non-invasive methods of fat loss are gaining popularity and reputation. Abdominal obesity is linked with insulin resistance, glucose intolerance, diabetes mellitus, hypertension, dyslipidaemia, sleep apnoea, arthritis, hyperuricemia, gall bladder disease, PCOD, coronary artery disease and certain types of cancer.

All the obese and overweight patients showed reduction in abdominal girth which was maximum up to 16.5 cms i.e. nearly 7 inches. Male and female patients responded almost equally to the LASER and Radiofrequency technology.

LASER lipolysis at 1060 nm by CALYSTA - Woxmen in association with radiofrequency tightening is promising nonsurgical tool for fat reduction around abdominal areas.

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