

Smoking and Reduction Mammoplasty: Does it Affect the Outcome?

Wael M.R. Sakr, M.D.

The Department of Surgery, Faculty of Medicine, Cairo University.

ABSTRACT

Twenty-five female patients with breast hypertrophy were included in this study. They were divided into 2 groups, group A (9) patients were smokers and the other 16 group B were non-smoker. All patients were operated upon using the inferior pedicle reduction mammoplasty technique. Four patients (44.2%) of the smoker group developed wound healing problems in comparison to two patients (12.5%) of the non-smoker group. Two patients (22.2%) of the smokers developed fat necrosis while no patient developed fat necrosis in the non-smoker group. Three patients (33.3%) of the smoker group developed loss of the areola. In the non-smoking group only one patient (6.25%) showed partial loss of the nipple-areola complex. Therefore, there was a statistically significant difference between the two groups regarding wound healing problems, fat necrosis and loss of the nipple-areola complex. These complications lead to longer hospital stay in the smoker group than the non-smoking group so; smokers undergoing reduction mammoplasty should be informed about their possible higher risk for wound healing problems. It is also advisable to ask the patient to abstain from all tobacco products for an interval of 4 weeks before through 4 weeks after surgery.

INTRODUCTION

Mammary hypertrophy is a pathological process where the breast is increased in size beyond normal proportions [1]. Breast hypertrophy has a variety of effects on different levels; physical effects and psychological effects. Physical effects include back, neck and shoulder pain, mastodynia, maceration and infection of the inframammary regions. The psychological aspects of macromastia can be equally devastating and include feelings of embarrassment, physical unattractiveness and lack of sexual appeal and femininity [2].

There are literally dozens of operations and variations to choose from when performing reduction mammoplasty. Most plastic surgeons have one or two techniques that they are comfortable with and that have given them consistent results.

Possible complications resulting from any of

the reduction techniques include; fat necrosis, hypertrophic scarring, total or partial loss of the nipple-areola complex, asymmetry, insufficient reduction, over reduction, change in sensation, loss of breast, infection and lactation problems [3]. Depending on the technique used, these complications have differing rates of occurrence.

Different surgeons obtain different results even using the same technique. The surgeons' aim is to minimize the rate of complications. In this study, a single technique was used by the same surgeon to study the effect of smoking on wound healing and complication in patient undergoing breast reduction for breast hypertrophy. Known complications of cigarette smoking are coronary heart disease, vascular diseases and lung cancer. Nevertheless, the effect of cigarette smoking in plastic surgery is underestimated. Previous studies have shown that smoking leads to a higher incidence of complications in face-life procedures in the form of skin slough or retro auricular necrosis and that smokers had a 12.5 fold chance of suffering skin slough than non-smoking patients [4,5].

PATIENTS AND METHODS

This study was conducted in Cairo University Hospitals during the period January 2002 to June 2003. Twenty-five female patients with breast hypertrophy were included in the study nine were smokers (A) and the other 16 were non-smokers (B). The smoker group (A) was smoking an average of 15.4 cigarettes per day (range 7 to 20 cigarette per day) for more than 5 years (range 5-15 Y.). All patients were operated upon using the inferior pedicle technique of reduction mammoplasty. Patients known to have severe arteriosclerosis, cardiac disease or diabetes mellitus were excluded from the study.

A chart was done for every patient including

the following information: age, cigarette consumption, weight of resected breast tissue, wound healing problems nipple and areola complications, fat necrosis, wound infection and length of hospitalization.

Patients with wound healing problems like skin slough, or dehiscence needed management in the form of wound irrigation and dressing, debridement or secondary sutures. In addition, fat necrosis, which occurred in some patients, needed wound irrigation and secondary closure. Wound infection was treated by antibiotic after doing culture from a wound swab. Areolar loss was treated by tattoo of the depigmented area. Patients were followed up until complete wound healing occurred.

RESULTS

During the 18 months period of the study, 25 female patients with breast hypertrophy were operated upon by inferior pedicle technique by one surgeon (the researcher). The mean age of the patients was 36.4 ± 6.7 years (range 23 to 56 years). The 25 patients were divided into 2 groups group (A) smokers 9 patient and group (B) non-smokers (16 patients). The mean age of non-smokers did not differ significantly from that of the smokers.

There was also no statistically significant difference between the two groups regarding neither the amount of breast tissue resected for reduction nor the distance of areola lift. Four patients (44.4%) of the smokers group developed wound healing problems. This was a significantly higher incidence than in the non-smoking group in which only two patients (12.5%) were noted to have wound healing problems.

Two patients (22.2%) of the smokers developed fat necrosis. This complication did not occur in the non-smoking group. Three patients (33.3%) of the smokers developed partial loss of the areola. In the non-smoking group only one patient (6.25%) showed partial loss of the nipple areola complex. It was noted that the three patients who developed partial loss of the areola in the smoker group; in two of them areola was lifted for a distance of 14.2 and 15.7 cm respectively. The case of partial areolar loss of the non-smoking group the areola was lifted for a distance of 11 cm.

Therefore, there was a statistically significant difference between the two groups regarding the complications of fat necrosis and loss of the nipple-areola complex. From the previous results, it appeared that the smokers have 3.5 fold more than

non-smokers for developing wound healing problems.

Tables (2 & 3) show the relation between amount of breast tissue resected in grams and incidence of wound healing problems in both groups.

It is apparent from the previous tables that huge breasts with excessive excision during reduction will add to the risk in wound healing problems in smoker patients more than non-smokers.

Non-smokers were discharged after a median of (7.3 days). Wound healing problems and fat necrosis made longer hospital stay necessary for smokers (median of 11.6 days) ($p < 0.01$).

Two patients of the four who had wound healing problem in the smoker group needed secondary closure while the other two healed by frequent dressing. In the non-smoker, group the two patients who had wound healing problem healed by only dressings.

One smoker (11.1%) developed wound infection requiring antibiotic treatment, compared to one non-smoker (6.25%) which was not significant.

Table (1): Comparison of data for smokers and non-smokers.

	Smokers n = 9	Non-smokers n = 16	<i>p</i>
Age	34.2 ± 6.8	38.1 ± 7.1	NS
Resected breast tissue (gm)	1125 ± 412	1095 ± 480	NS
Areola lifted for	Mean of 11 cm (range 8 to 15.7 cm)	Mean of 12.2 cm (range 9 to 16.8 cm)	NS

N.S.: Non-specific.

Table (2): Relation between amount of breast tissue resected in grams and incidence of wound healing problems in smokers.

	< 1000 grams n = 4	> 1000 grams n = 5
Wound healing problems	1	3

Table (3): Relation between amount of breast tissue resected in grams and incidence of wound healing problems in non-smokers.

	< 1000 grams n = 7	> 1000 grams n = 9
Wound healing problems	1	1

Table (4): Comparison of two groups regarding complications and hospital stay.

	Smokers n = 9	Non-smokers n = 16
Wound healing problems	4 (44.4%)	2 (12.5%)
Fat necrosis	2 (22.2%)	–
Loss of nipple-areola complex	3 (33.3%)	1 (6.25%)
Hospital stay	11.6 days	7.3 days

DISCUSSION

Several studies showed that smokers had a significantly higher chance of developing wound healing problems than non-smokers after undergoing face-lift [5,6].

Kroll [7] found a 27.5% incidence of flap necrosis after transverse rectus abdominis muscle flap for breast reconstruction in smokers compared with 5.9% in non-smokers.

These results are similar to data of this study. In reduction mammoplasty, the blood supply to the nipple-areola complex is supplied to the distal portion of the flap (pedicle) through the dermal-subdermal plexus. This also applies to the distal part of the lateral and medial flaps, which form the vertical limb of the inverted-T at closure. Cutaneous tissue beds have the highest sympathetic innervations and the least autoregulatory control. Their blood flow is mediated through alpha receptor activation [4]. Because of the vasoconstrictive effects of cigarette smoke (sympathetic innervation through alpha receptors), the effect on cutaneous tissues is apparent. Smoking also increases the serum level of carboxyhemoglobin, which leads to a reduced oxygen-carrying capacity of the blood, thus creating a hypoxic state [8]. Carboxyhemoglobin also increases platelet adhesiveness, leading to microangiopathic thrombosis resulting in total or partial flap loss (nipple-areola complex problems).

Reports of major flap necrosis after abdominoplasty in smokers support this hypothesis [9]. In another study, 47.9 percent of the smokers showed wound healing problems before hospital discharge versus 14.8 percent of the nonsmokers [10].

Analysis of our data revealed a 3.5 fold increase in the chance of developing wound healing problems in smokers compared with non-smokers. We also found a significant difference between smokers and non-smokers regarding the complications of fat necrosis and areola loss. The increased incidence of wound healing problems and other complications in smokers leads to longer hospital stay (4.3 days longer than for non-smokers, $p < 0.01$).

Conclusion:

Perioperative smoking results in significantly higher complication rates (specifically wound healing and vascularity problems). It is advisable when planning to do reduction mammoplasty for a smoker to ask the patient to abstain from all tobacco products for an interval of 4 weeks before and 4 weeks after surgery.

Smokers should be informed about their possible higher risk for wound healing problems. When we are faced with doing reduction mammoplasty in smokers we have to choose patients with moderate hypertrophy in whom less amount of breast tissue will be resected with minimal dissection so as not to affect the vascularity of flaps. In addition, fewer complications will be expected in those patients if the distance of areola lift is minimal. It is advisable to do a study with a greater number of patients, on the effect of smoking on smoker patients undergoing reduction mammoplasty to have the proper recommendation and precautions when operating (reduction mammoplasty) for a smoker patient and to confirm these results.

REFERENCES

- 1- Bricout N.: Breast surgery. Springer-Verlage, Paris, 1996.
- 2- Raispiss T., Zehring R.D. and Downey D.L.: Long-term functional results after reduction mammoplasty, *Ann. Plast. Surg.*, 34 (2): 113-116, 1995.
- 3- Bostwick J.III: In: Plastic and reconstructive breast surgery, St. Louis. Missouri: Quality Medical Publishing, Inc., 1990.
- 4- Chang L.D., Bunke G. and Slezak S.: Cigarette smoking, plastic surgery and microsurgery. *J. Reconst. Microsurg.*, 12: 467, 1996.
- 5- Rees T.D., Liverett D.M. and Guy G.L.: The effect of cigarette smoking on skin flap. Survival in the face lift patients. *Plast. Reconst. Surg.*, 73: 911, 1984.
- 6- Riefkohl R., Wolfwe J.A. & Cox E.B.: Association between cutaneous occlusive vascular disease, cigarette smoking and skin slough after rhytidectomy. *Plast. Reconst. Surg.*, 77: 596, 1986.
- 7- Kroll S.S.: Necrosis of abdominoplasty and other secondary flaps after TRAM flap breast reconstruction. *Plast. Reconst. Surg.*, 94: 637, 1994.
- 8- Smith J.J. and Kampine J.P.: Circulatory physiology: The essentials, 2nd Ed. Baltimore: Williams and Wilkins, p. 140, 1990.
- 9- Grazer F.M. and Goldwyn R.M.: Abdominoplasty assessed by survey with emphasis on complications. *Plast. Reconst. Surg.*, 59: 513, 1977.
- 10- Edouard H., Manassa M.D., Cathrine H., Hertl M.D. and Rolf-Ruediger Olbrisch: Wound healing problems in smokers and nonsmokers after 132 abdominoplasties. *Plast. Reconst. Surg.*, 111 (6): 2082-2087, 2003.