Original Research

Incidence and Risk Factors for Major Hematomas in Aesthetic Surgery

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ABSTRACT

Introduction- After aesthetic surgery, one of the most common side effects is postoperative hematomas. Research with limited power and experiences from a single institution have hindered the ability to identify risk factors for hematopoiesis. The aim of present study was to assess the incidence and risk factors for major hematomas in aesthetic surgery.

Material and methods- The present prospective study was conducted at a tertiary care centre among 500 patients who visited to department of plastic surgery for cosmetic procedure during the study period of one year. The study examined patient characteristics, risk factors, and hematoma rates among patients who underwent different combinations of procedures using SPSS version 25.0.

Results- Presence of hematoma was found in 1% of patients while it was absent in 99% of cases. Overall, the mean age was 40.9 ± 13.8 years and the mean BMI was 24.6 ± 4.4 kg/m2. There were 180 male and 319 females. More complications were present in combined procedures (60%) as compared to single procedures (40%). Independent risk factors ($P < 0.05$) for postoperative hematomas after cosmetic procedures include: age, gender (male) , combined procedures, and breast procedures

Conclusion - After cosmetic surgery, the most frequent complication is a major hematoma. Patients who are male and undergoing breast or combined operations are at a notably increased risk of hemorrhaging.

Keywords – aesthetic, cosmetic , hematomas, incidence, plastic surgery, risk

INTRODUCTION

There is a significant and rapid increase in the annual number of aesthetic surgical operations being performed. Breast augmentation and suction-assisted lipectomy (SAL), sometimes referred to as liposuction, are the most commonly done cosmetic operations worldwide. Cosmetic operations are highly profitable and, due to the lack of legal limitations, are increasingly being conducted by surgeons in outpatient facilities. The view of the general public regarding these surgeries as simple procedures increases the likelihood of serious complications with possibly lethal outcomes. The documented fatality rate for these surgeries is 1 in every 5000 procedures.[1]

A common complication that might occur after cosmetic surgery is the creation of a hematoma. The reported incidence rates of hematomas vary according on the specific technique and the characteristics of the patients. In body contouring surgery, the rates range from 3% to 15%.[2] For facelift and facial rejuvenation procedures, the rates range from 0.2% to 12.9%.[3] In breast augmentation surgery, the rates range from 0.6% to 5.7%.[4] Various risk factors that increase the likelihood of postoperative bleeding and hematoma formation have been previously identified. These include demographic factors like gender and smoking status, medical conditions such as hypertension and malignancy, the use of anticoagulant medications, specific surgical and anaesthetic techniques, and the way postoperative care is managed.[5] The majority of studies in the existing literature that investigate the occurrence and factors contributing to hematoma formation are constrained by their retrospective methodology, small sample size, and focus on aesthetic surgical procedures conducted at a single institution. Due to the growing prevalence of cosmetic treatments, there is a demand for more rigorous research to address these constraints and offer up-to-date understanding of postoperative hematomas in patients undergoing cosmetic surgery.[6]

The major objective of plastic surgeons is to minimise the risk of complications and the subsequent increase in medical expenses from reoperations, as well as to enhance patient satisfaction. Hence, the present task is to precisely forecast the likelihood of the most common problems in order to decrease illness and death rates, enhance suitability, and offer suggestions to mitigate the patients' risk prior to surgery.[7-9] Hence the present study was done to determine the incidence of postoperative hematoma in patients undergoing cosmetic procedures. Furthermore, the study aimed to assess the risk factors that predispose to hematoma formation among individual and combined cosmetic procedures.

MATERIAL AND METHODS

The present prospective study was conducted at a tertiary care centre among patients who visited to department of plastic surgery for cosmetic procedure during the study period of one year. Ethical permission was taken from institutional ethical committee before commencement of study. Patients were asked to sign an informed consent form after explaining them the complete procedure.

A total sample size of 500 patients was taken on the basis of convenience sampling. Patients who underwent cosmetic surgery were selected on the basis of inclusion and exclusion criteria.

Inclusion criteria

1. Patients above the age of 18 years.
2. Patients who were undergoing cosmetic surgery for the first time
3. Patients who signed written informed consent before the procedure.

Exclusion criteria

1. Patients below the age of 18 years
2. Patients suffering with any co morbidity.
3. Patients failed to sign the consent form.

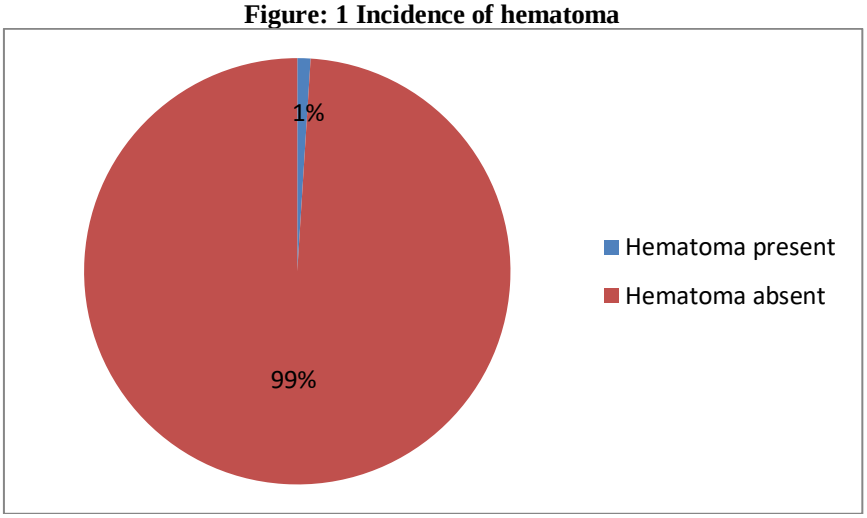
Patients factors like age, gender, BMI, smoking, diabetes mellitus, procedure by body region, and combined procedures were was noted. Cosmetic procedures were grouped into categories face (ie, blepharoplasty, browlift, cheek implant, chin augmentation, facelift, facial resurfacing, hair replacement, otoplasty, rhinoplasty), breast (ie, augmentation, mastopexy, male breast surgery, reduction, revision of breast implant procedures), and body (ie, abdominoplasty, brachioplasty, buttock lift, calf implant, labioplasty, liposuction, lower body lift, thigh lift, upper body lift). All the risk factors and complications of the procedure were noted down.

The study examined patient characteristics, risk factors, and hematoma rates among patients who underwent different combinations of procedures using statistical tests such as two-tailed t test, Fisher exact test, or Pearson chi-square test. After categorising the data by the kind of procedure combinations, a univariate analysis was conducted to examine the risk factors associated with hematoma. Age and BMI were categorised as ordinal variables with clinically relevant categories for the purpose of univariate analysis. A logistic regression analysis was conducted to identify the independent risk factors for postoperative hematomas. Age and BMI were included as continuous variables for logistic regression analysis. Statistical significance was determined using a type I error probability of less than 5% ($P < 0.05$), unless stated otherwise. The studies were conducted using IBM SPSS Statistics 25.0 software developed by IBM Corporation.

RESULTS

Presence of hematoma was found in 1% of patients while it was absent in 99% of cases as shown in figure 1.

Figure: 1 Incidence of hematoma



Overall, the mean age was 40.9 ± 13.8 years and the mean BMI was 24.6 ± 4.4 kg/m2. There were 180 male and 319 females. The majority of cases in the entire study were isolated procedures. Patient demographics and other

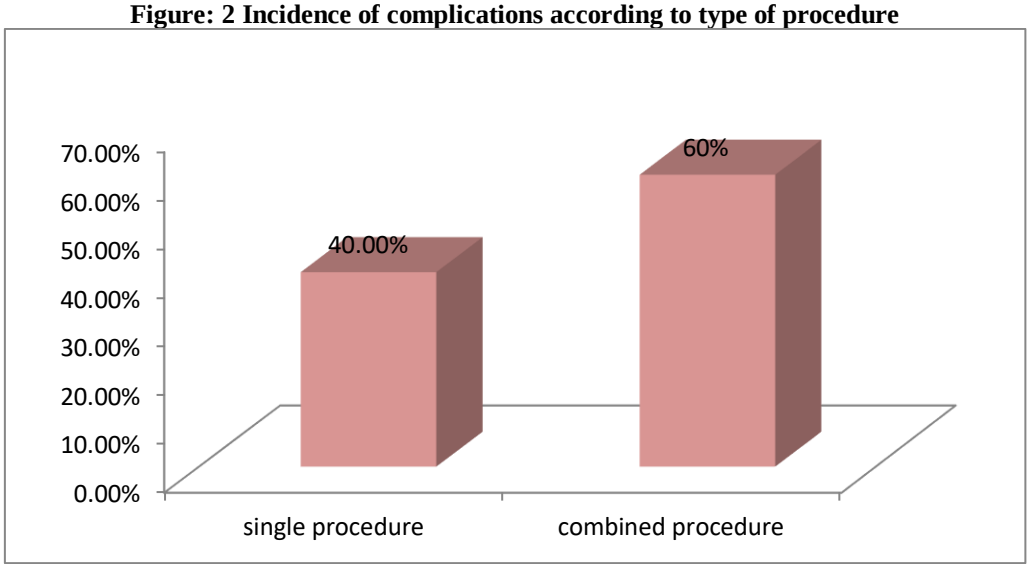
characteristics comparing the 2 patient populations (ie, patients with and without a postoperative hematoma) is shown in Table 2.

Table: 2 Clinical and demographic characteristics

Variable		Hematoma present (n=5)	Hematoma absent (n=495)	P value
Mean age (years)		40.9±3.9	41.5±4.7	<0.05
Gender	Male	2 (40)	178 (35.9)	<0.05
	Female	3 (60)	317 (64.1)	
Mean BMI (kg/m^2)		24.6±3.8	25.7±4.2	0.17
Smoking		1 (20)	119 (24.04)	0.28
Diabetes mellitus		1 (20)	112 (22.6)	0.75
Combined procedures		3 (60)	213 (43.03)	<0.05
Single procedure	Breast	1 (20)	105 (21.2)	<0.05
	Body	0	70 (14.1)	
	Face	1 (20)	107 (21.6)	

More complications were present in combined procedures (60%) as compared to single procedures (40%) as shown in figure 2.

Figure: 2 Incidence of complications according to type of procedure



On multivariate logistic regression, independent risk factors ($P < 0.05$) for postoperative hematomas after cosmetic procedures include: age, gender (male) , combined procedures, and breast procedures rather than the body extremity and face procedures. BMI, smoking, and diabetes mellitus were not significant risk factors for major hematomas as shown in table 3.

Table: 3 Risk Factors for Major Hematomas for all Cosmetic Procedures

Risk factor	Relative risk	95% confidence interval	P value
Age	1.012	1.003-1.017	<0.05
Male Gender	1.96	1.64-2.40	<0.05
Smoking	1.13	0.92-1.34	0.43
BMI	1.02	0.98-1.0	0.30
Diabetes	1.40	0.91-1.92	0.17
Combined procedure	1.38	1.21-1.54	<0.05
Breast procedures	1.80	1.56-2.01	<0.05

DISCUSSION

The aim of present prospective study was to determine the frequency of significant hematomas occurring after cosmetic surgical operations among patients. The overall occurrence was determined to be minimal, with a rate of 1%. Although hematoma had a low occurrence rate, it remained the most frequently detected significant complication. This study presents new information regarding postoperative hematomas as a significant complication in several cosmetic surgery procedures, including rhinoplasty, blepharoplasty, chin augmentation, and cheek implants.

An analysis of the existing literature found that there is a significant variation in the occurrence of hematomas for some commonly performed procedures. The rates observed in this extensive study were found to be around the lower end of this range. As an illustration, the incidence of hematoma after breast augmentation in the existing literature varies from 0.6% to 5.7%, although our study determined it to be 1%. Similarly, the occurrence of hematoma following facelift surgery varies from 0.2% to 12.9% according to existing research. Previous research on body contouring surgeries has reported hematoma rates between 3% and 15%. The probable cause for the decreased occurrence of hematomas in our group is we recorded significant hematomas that necessitated immediate medical attention, hospitalization, or further surgical intervention. It did not include mild hematomas that are managed in an outpatient setting. One further aspect that may have contributed to the reduced rates observed in our study is the uniformity in the level of expertise and training among the physicians. Nevertheless, this series is among the most extensive in assessing significant hematomas that occur after cosmetic surgery. It has the potential to offer more universally relevant rates for the many types of patients and practitioners who do these distinct procedures. The main objective of this study was to determine the risk variables that contribute to a higher occurrence of hematomas after cosmetic surgery, with the aim of reducing their negative effects and improving the aesthetic outcomes. This investigation is one of the broadest in the current body of literature that investigates several aspects, both linked to the patient and the treatment, that influence the occurrence of significant hematomas following aesthetic surgery. The impact of age on the likelihood of postoperative problems in aesthetic surgery has become a subject of increased interest in recent years, particularly due to the rise in cosmetic operations among older individuals. The American Society for Aesthetic Plastic Surgery's National Data Bank records reveal a rise in cosmetic surgery operations among patients aged 65 and above, from 4.2% in 2005 to 7.5% in 2015.[10] This phenomenon can be attributed to the increasing accessibility and reduced invasiveness of cosmetic operations. While there has been increased focus on the impact of aging on complications following aesthetic surgery, there is currently a lack of available literature on the results specifically in older patients. Marten et al found no significant disparity in the occurrence of major (2.9% vs 2.0%, $P = 0.65$) or mild (5.9% vs 6.1%, $P = 0.99$) complications after facelift surgeries between senior patients (age > 65 years) and younger patients (age < 65 years).[11] These findings were observed even though the senior group had a higher American Society of Anesthesiologists (ASA) score. Becker et al demonstrated that patients aged 75 years and older suffer comparable risks of postoperative complications from facelift surgeries as middle-aged patients, when considering their ASA class.Twenty-four Similarly, a thorough examination of complications following breast augmentation over a span of 12 years revealed no statistically significant correlation between older patients and the occurrence of hematoma formation.[12] A prior investigation conducted by our research team, which compared the occurrence of postoperative complications in two age groups (young: age < 65 years, elderly: age ≥ 65 years) undergoing aesthetic surgical procedures, revealed no statistically significant disparity in the overall rates of major complications. However, it was observed that younger patients had a higher prevalence of hematomas.[13] However, Abboushi et al discovered that individuals who are 55 years or older and undergo facelift surgery had a greater likelihood of experiencing hematoma.[14] Furthermore, Richard et al. discovered that age was identified as a risk factor for hematoma following breast augmentation during univariate analysis ($P < 0.01$). However, this association did not remain statistically significant during multivariate analysis.[15] The present study has demonstrated that as individuals age, there is a marginal elevation in the likelihood of experiencing postoperative large hematomas after undergoing cosmetic operations. This may be attributed to the higher likelihood of elderly patients having undiagnosed or insufficiently controlled hypertension, or taking drugs that can impact the coagulation process, both of which have been associated with the formation of postoperative hematomas.[14] Previous studies have established that gender is a risk factor for the occurrence of postoperative hematomas in various plastic surgery populations. Multiple studies have specifically shown a correlation between being male and the occurrence of hematoma formation in individuals who undergo facelift surgery and body sculpting treatments. [16-18] Previous researchers have sought to elucidate this correlation in individuals undergoing facelift surgery by assessing the facial skin perfusion of both males and females using a laser Doppler flow sensor. Women had considerably lower face skin perfusion compared to men, mostly due to a lesser quantity of perfused microvessels. [19] Furthermore, men possess prominent terminal facial hair in contrast to the delicate vellus facial hair found in women. The increased vascularity of their face skin is due to the fact that the blood supply to a specific hair follicle is dependent on the size of the follicle. A larger diameter follicle allows for a greater number of capillaries to pass through the dermal papilla.[19] Additional research is required to investigate the correlation between gender and the development of hematomas in different groups undergoing cosmetic surgery. In recent years, combined procedures have become increasingly popular and are now a realistic choice for both patients and healthcare providers. In our study, 60% of the surgeries were performed on patients with hematoma, while 43.33% were performed on patients

without hematoma. Plastic surgeons regularly provide combined operations due to the financial incentive for the patient and the advantage of undergoing only one postoperative recovery.[20,21] The safety of these operations continues to be a primary concern, especially among individuals undergoing elective aesthetic surgery. The rate of postoperative hematoma was greater in combined surgeries compared to solo procedures. The cause of this observation is uncertain and could be related to meticulous patient selection. Further research is required to thoroughly examine this intriguing discovery. Prior research has conducted limited investigations on the correlation between combined operations and postoperative hematomas, yielding inconclusive findings. Coon et al assessed a total of 609 patients who underwent 1070 body contouring surgeries following significant weight loss. Their study revealed that there was no association between the number of concurrent procedures conducted and the occurrence of hematoma formation after surgery ($P = 0.25$).[22] In contrast, Nguyen et colleagues conducted a research on 2294 patients who underwent brachioplasty and found that combined procedures resulted in a higher incidence of hematomas compared to single procedures (1.6% vs 0.1%, $P < 0.01$). Furthermore, combination procedures were identified as an independent predictor for postoperative hematomas.[23] Furthermore, our analysis has shown that the combination of procedures is a distinct factor that predicts the occurrence of hematoma formation. One potential reason for this discovery is the longer amount of time it takes to do each subsequent procedure, as demonstrated by previous studies.[24] Surgeon weariness can cause less careful control of bleeding and increase the chances of intraoperative hypothermia, which could potentially interfere with the body's blood clotting process. The study identified that the body area was a significant risk factor for the occurrence of large hematomas. There is a scarcity of literature that particularly examines the impact of various body locations on the occurrence of postoperative hematomas following aesthetic surgery. Our data found that individuals who had cosmetic breast treatments had a considerably greater risk of developing hematomas compared to those who had face and body procedures. This is particularly significant given that, based on our research, breast treatments rank among the most often conducted aesthetic surgical interventions. Plastic surgeons must acknowledge the heightened risk associated with various regions of the body in order to provide appropriate guidance to their patients. Furthermore, plastic surgeons should prioritize meticulous control of bleeding during surgery to minimize the occurrence of hematomas related to breast procedures. Additionally, they should maintain heightened vigilance in the postoperative period to promptly detect and effectively address any such complications. Small sample size and study at a single centre serve as a main limitation to our research. Also perioperative measures that may play a role in the development of postoperative hematomas such as chemoprophylaxis use for thromboembolism prevention, intraoperative body temperature and blood pressure regulation, as well as operative times were not analyzed in our study.

CONCLUSION

The most prevalent complication observed in this group of patients after cosmetic surgical procedures was a significant hematoma, but the overall occurrence rate was quite modest at 1%. Additional notable risk factors for hematomas encompassed advancing age and procedures conducted within a hospital environment, potentially indicating the prudent selection of "higher risk" patients by highly skilled plastic surgeons. Obesity, smoking, and diabetes did not provide independent predictive ability for postoperative hematomas after cosmetic surgical procedures. Having a comprehensive understanding of the risk factors associated with the most frequently encountered significant problems after aesthetic surgical procedures enables healthcare providers to educate patients more effectively and be more aware of patients who are at a higher risk. This has the potential to enhance patient safety and improve outcomes after surgery, while also establishing reasonable patient expectations.

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