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UNRAVELING THE COMPLEXITY OF ANESTHETIC COMPLICATIONS IN TUMMY TUCK PROCEDURES

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Abstract:

Background: Currently, abdominoplasty is experiencing a surge in popularity both internationally and nationally due to the procedure is a safe and effective way to treat obesity and associated comorbidities, which in turn improves the quality of life of those who undergo it. This study was aimed at determining and investigating in the complexity of the anesthesia impact on patients who underwent tummy tuck procedures. **Patients and methods:** Clinical data were collected for 86 patients who underwent tummy tuck surgery from different hospitals in Iraq, where the ages of the patients ranged between 25 - 55 years. The surgical data was divided into two groups: where group A included 43 patients who had surgery under spinal anesthesia, and Group B was the group of patients who had tummy tuck surgery under general anesthesia and included 43 patients. Clinical examinations and measurements of the patient's pain rate and quality of life were performed. Furthermore, this study compared both anesthesias to determine the prevalence of complications and their impact on patients' postoperative health. **Results:** Our study enrolled surgical data of patients, which found that females had more participants with 52 cases than males with 34 cases, patients with a BMI (27.5 – 30.8) had 25 cases, and patients with BMI > 30.8 included 45 cases. According to the GA group,

surgical duration was 184.85 ± 27.45 min, anesthesia time (min) was 188.65 ± 30.54, hypotension (<90/60 mmHg) was 3 cases, bradycardia (HR <50 beat/min) was 4 cases, NOV% was no cases, length of stay in hospital was 0.8 ± 0.13 days, postoperative complications were 28 cases. According to the SA group was, surgical duration was 189.17 ± 26.38 min, anesthesia time (min) was 198.46 ± 27.58, hypotension (<90/60 mmHg) was 8 cases, bradycardia (HR <50 beat/min) was 6 cases, NOV% was 15 cases, length of stay in hospital was 1.8 ± 0.25 days, postoperative complications were 15 cases. **Conclusion:** The current study showed that spinal anesthesia is considered the most effective and high-quality solution in the surgical procedure for abdominal tightening operations in the clinic due to the fewer complications associated with it than general anesthesia

Keywords: *Tummy Tuck Procedures; Spinal anesthesia; General anesthesia; Quality of life; and Complications.*

Introduction

Introduction

Obesity has reached epidemic proportions worldwide. Although it was previously considered a problem confined to high-income countries, it is now also prevalent in low- and middle-income countries. Defined by the World Health Organization (WHO) as an abnormal or excessive accumulation of fat that can be harmful to health. [1]

Among the surgical treatments proposed by the International Federation of Obesity Surgery and Metabolic Diseases are bariatric surgery, in which patients experience a loss ranging from 50% to 65% of their original weight and subsequently require plastic surgery to correct the excesses of skin tissue after this significant weight loss; therefore, these are a type of patients who see themselves benefiting from abdominoplasty. [1,2]

According to the Spanish Society of Reconstructive and Aesthetic Plastic Surgery (SECPRE), abdominoplasty is an operation consisting of the removal of excess skin and abdominal fat and the correction of muscle flaccidity [3]. It is currently one of the most demanded cosmetic surgeries and one that patients value the most. According to the International Society of Aesthetics and Plastic Surgery (ISAPS), which released this year, the results of its international report for all aesthetic procedures completed in 2016 [4], which showed an overall increase of 10%, the United States tops the list with 4.3 million cosmetic interventions per year, which corresponds to 17.6% of the total. Followed by Brazil, with 2.5 million.

The ideal candidates for abdominoplasty are patients whose skin and fat on their abdomen hang down after excessive weight loss, in addition to the scars of caesarean sections in women where pregnancy has been very prominent or women who have had multiple pregnancies (in patients after pregnancies, there is usually diastasis of the muscles of the anterior wall). [5]

Sometimes, the abdominoplasty is usually combined with liposuction, being called an abdominolipoplasty or lipo abdominoplasty, for the elimination of localized fat and thus improving the appearance of the abdomen, obtaining a flat belly and a slender figure, thus altering the patient's perception of his own image and creating a scar compatible with his goals and lifestyle. [6,7]

The aesthetic correction of the contour of the abdomen requires an exhaustive evaluation of the patient with respect to certain anatomical parameters, the presence of which will condition the decision-making of the abdominoplasty technique that should be indicated according to the case. The assessment of these patients is based on the classification proposed by Matarasso in 1995, where he recognizes some important factors, such as skin, adipose tissue, and muscles. [8]

In this type of intervention, in contrast to the classic abdominoplasty, both general anesthesia and epidural sedation could be used, but the general one is preferred since the epidural patients report some discomfort while the intervention is taking place. [9,10]

Patients and methods

During a period starting from March 2023 till November 2023 at different hospitals in Iraq, among either sex of adults aged between 25–55 years belonging to ASA physical status classes I and II who were undergoing abdominoplasty, an 86 patients cross-sectional study was done.

The preoperative period they involved the assessment of all patients, with a view to providing information to them on issues touching on general anesthesia as well as spinal anesthesia and the possibility of transitioning to general anesthesia while under the knife should they experience any form of discomfort or persistent pain even after being given intravenous analgesics or sedatives. The study excluded patients with a BMI greater than 35 kg/m2 who were morbidly obese, those who opposed regional anesthesia, and people having contraindications for it, including spinal deformities, bleeding disorders, or local infections.

There were two groups, each having 43 participants: the first group receiving general anasthesia (Group GA), while the second underwent surgery under spinal anesthesia (Group SA).

Before the operation, all the patients refrained from eating or drinking for a minimum of eight hours. Four hours prior to surgery, Dr. Shepard allowed them to drink fluids that were not opaque or carbonated. On the way to the operation room, all the patients were given oral midazolam 7.5 mg a half hour earlier such that they slept throughout the operation.

The patients were connected to noninvasive monitoring (blood pressure measuring, pulse oximeter, and 5-lead electrocardiogram) upon their arrival in the operating room so that they could have their vital signs taken and recorded. Every single one of the patient's legs was put in a sequential compression device in order to prevent deep venous thrombosis (DVT) after the operation.

In Group GA, anesthesia was performed using ketamine 0.25 mg.kg-1 as the preemptive analgesic, fentanyl one ug.kg-1, and propofol 2 mg.kg-1 intravenously. Cisatracurium 0.15 mg.kg-1 was administered for three minutes before endotracheal intubation to assist intubation. All patients were ventilated using intermittent positive pressure ventilation with a tidal volume of 6-8 mL.kg-1 and a respiratory rate of 14-18 rate/min. Ventilator settings were adjusted accordingly to keep end-tidal CO2 levels among 35 and 40 mmHg. Sevoflurane inhalation was utilized to sustain anesthesia. Following the procedure, the patient was woken, extubated, and transferred to a postoperative care unit in continuous monitoring.

In Group SA, all patients received 500 mL in 10 mL. kg-1 Ringer's solution as a preload before to anesthesia. After adequate skin cleaning with alcohol-based chlorhexidine (70% isopropyl alcohol + 2% chlorhexidine gluconate), lidocaine1% 3-5 mL was injected for cutaneous anesthetic at the L3-L4 or L4-L5 intervertebral spaces. Following aspiration in clear cerebral spinal fluid, strong bupivacaine 0.5%, 15-20 mg, and fentanyl 25 ug were administered intrathecally.

Postoperative pain was measured at rest for 3 hours, 6 hours, 8 hours, and 12 hours after surgery (using a VAS with a 10 cm horizontal line that ranges from 0 = no discomfort to 10 = severe pain). If the VAS was ≥4, 0.1 mg.kg-1 nalbuphine was given intravenously. If the score did not decrease after 15-20 minutes, an additional 0.05 mg.kg-1 nalbuphine proved given. The overall dose of nalbuphine ingested by every patient was determined 12 hours after surgery.

After being released from the hospital, every patient was given acetaminophen through the mouth at 500 mg twice a day and ibuprofen through the mouth at 400 mg daily over five days following surgery. Two days later, the score of patient satisfaction was obtained on a scale from zero (extreme dissatisfaction) to ten (absolute satisfaction)

Results

Table 1: Preoperative data.

Characteristics	Frequency [n = 86]	Percentage [%]
Age		
25 – 35	24	27.91%
36 – 45	30	34.88%
46 - 55	32	37.21%
Sex		
Male	34	39.53
Female	52	60.47
BMI, [kg/m2]		
< 27.5	16	18.60%
27.5 – 30.8	25	29.07%
> 30.8	45	52.33%
Smoking status		
Smokers	26	30.23%
Non - smokers	60	69.77%
ASA %		
I	64	74.42%
II	22	25.58%
Comorbidities		
Yes	38	44.19%
No	48	55.81%
Hypertension	25	29.07%
Diabetes	14	16.28%
Thyroid	4	4.65%
Asthma	6	6.98%
Kidney disease	7	8.14%
Education status		
Primary	10	11.63%
Secondary	20	23.26%
College/university	56	65.12%
Income status		
< 800	37	43.02%
801 – 1000	33	38.37%
> 1000	16	18.60%

Table 2: Surgical findings of tummy tuck procedures.

Variables	General anesthesia [43]		Spinal anesthesia [43]	
	F	P %	F	P %
Surgical duration (min)	184.85 ± 27.45		189.17 ± 26.38	
Anesthesia time (min)	188.65 ± 30.54		198.46 ± 27.58	
Bleeding				
Yes	2	4.65%	5	11.63%
No	41	95.35%	38	88.37%
Hypotension	3	6.98%	8	18.60%

(<90/60 mmHg)				
Bradycardia (HR <50 beats/min)	4	9.30%	6	13.95%
O2 saturation <90%	0	0%	0	0%
Shivering	0	0%	11	25.58%
Nausea and vomiting	0	0%	15	34.88%
Need for intraoperative analgesia (n)	0	0%	23	53.49%
Length of stay in hospital, days	0.8 ± 0.13		1.8 ± 0.25	
ICU admission				
Yes	2	4.65%	8	18.60%
No	41	95.35%	35	81.40%
Mortality rate				
Yes	0	0%	0	0%
No	43	100%	43	100%

Table 3: Assessment post – operative pain scores of patients by VAS scale.

VAS scores	General anesthesia	Spinal anesthesia	P - value
3 hr	4.5 ± 0.6	6.7 ± 1.2	< 0.01
6 hr	3.8 ± 0.4	5.0 ± 0.6	< 0.01
8 hr	1.0 ± 0.3	4.3 ± 0.8	< 0.01
12 hr	0.6 ± 0.04	3.1 ± 0.2	< 0.01

Table 4: Postoperative complications.

Variables	General anesthesia		Spinal anesthesia		P - value
	F	P%	F	P%	
Nausea/vomiting	7	16.28%	2	4.65%	< 0.01
Shivering	9	20.93%	5	11.63%	< 0.01
Urinary retention	12	13.95%	8	9.30%	0.021
Postdural puncture headache	0	0.00%	0	0.00%	0.05
Deep venous thrombosis	0	0.00%	0	0.00%	0.05
Total	28	51.16%	15	25.58%	< 0.01

Table 5: Patient satisfaction findings.

Items	General anesthesia		Spinal anesthesia	
	F	P%	F	P%
Excellent	20	46.51%	19	44.19%
Good	12	27.91%	12	27.91%
Fair	7	8.14%	8	9.30%
Poor	4	4.65%	4	4.65%

Table 6: Assessment of postoperative quality of life.

Items	GA	SA	P - Value
Physical function	78.20 ± 9.63	84.33 ± 7.62	0.044
Psychological function	82.28 ± 7.61	72.16 ± 6.59	0.0392
Social and emotional functions	77.73 ± 6.38	80.20 ± 7.19	< 0.001
Daily activity	75.18 ± 12.91	72.92 ± 8.76	0.0412

Discussion

Abdominoplasty is carried out in many offices as a surgical procedure. This research validated the possibility of enough subarachnoid anesthesia available during abdominoplasty surgeries. Some literature states that the number of DVT cases after abdominoplasty is substantially higher than after other types of plastic surgeries. [11]

It was mentioned that whenever possible, operations lasting over 3 hours should be done using local anaesthesia rather than general anaesthesia since the other one is associated with higher incidences of DVT under long-lasting surgeries. Local and monitored analgesic sedation with/without i.v. Sedation is better than neuroaxial blockade, and neuroaxial blockade is safer to patients compared to general anaesthesia. [12]

General anesthesia can be more harmful than regional anesthesia in abdominal surgeries. However, the anesthetist avoids them because they induce intense respiratory cramps, indicting the need to wind it down by the surgeon in case of patients having very tight abdominoplasty. Hypoxia/hypoventilation-related complications occur very quickly because patients breathe spontaneously throughout the operation. [13,14]

The safety of spinal anesthesia in laparoscopy and other outpatient surgical procedures has been thoroughly discussed [15]. Because of extended recovery time from spinal anesthesia, typically arising from the motor block, higher expenses had been viewed as a factor hampering the use of spinal anesthesia for outpatient procedures. [16]

In spite of this, a prospective, randomized, controlled trial carried out by the authors established similar recovery profiles between patients who underwent general anesthesia with desflurane and those who received spinal anesthesia. The administration time, cost, and recovery period of anesthesia was found to be the same in both groups. [17]

Chilvers et al. compared the costs of shallow-dose spinal anesthesia and general anesthesia for laparoscopic outpatient practices. Whereas the requirement for postoperative analgesia was decreased through the use of spinal anesthesia, the two techniques had identical prices as regards anaesthesia expenditure and costs of recovery in total. [18]

Although there were no complications with the anaesthesia either during or after the procedure, there were significant discrepancies in the way the two forms worked as hypotension, shivering, postoperative nausea, and/or vomiting were markedly more pronounced when spinal anaesthesia was used in comparison to its epidural counterpart. Additionally, several other adverse effects that typically occur during spinal anaesthetics like this can easily be managed completely. While general anesthesia may also induce it, having up to 20% of patients experiencing it, urinary retention was more common during spinal anesthesia, thought to be related with neuraxial blockade. [19]

Conclusion

This current study stated that general anesthesia is considered an imperfect technique in tummy tuck operations and is effective due to the serious complications it causes after the surgical operation. However, general anesthesia provides comfort and stability in the patient's surgical procedure.

Unlike spinal anesthesia, it represents an excellent technique for patients, which is accompanied by complications and less pain, taking into account that the surgical procedure does not exceed 3 hours.

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