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Assessment of Postoperative Recovery: Anaesthesia Influence on Surgical Care Outcomes

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Abstract: Surgical treatment has changed drastically, with improvements in anesthetic, perioperative care, and surgical methods all being crucial to bettering patient outcomes. This study aims to enroll clinical outcomes after surgery and assess anesthesia's impact on the surgical outcomes of patients. During the follow-up period between March 2023 and May 2024, this study recorded the clinical characteristics and data of 112 patients who underwent surgery under anesthesia at hospitals in Baghdad, Iraq. Surgical outcomes were recorded for all patients who underwent surgeries (including hemorrhoid surgery, kidney stone removal, and thyroid surgery) under general anesthesia, regional anesthesia, and spinal anesthesia. This study recorded post-operative data on patients' complications, length of hospital stay, recovery rate, mortality, and overall quality of life. According to surgical outcomes, a total of 112 patients' surgical data were enrolled in this study. In terms of hemorrhoid outcomes, operative time was 42.2 ± 8.1 min, No. of bleeding got 7.14%, death with 4 cases only under GA, operative time was 39.4 ± 3.7 min under LA, No. of bleeding got 2.68%, death with 2 cases, and SA outcomes found operative time was 37.5 ± 4.4 min under SA, No. of bleeding got 0.89%, death without cases. In terms of kidney stone removal outcomes, operative time was 46.4 ± 5.7 min under GA and 41.2 ± 3.8 under SA, while total thyroidectomy was 61.5 ± 9.7 min under GA. In the evaluation of general health, we found that patients who underwent surgery under GA got the lowest in both of physical function and daily activity, where it indicated 74.36 ± 7.68, while highest in the SA group with 92.23 ± 2.34, daily activity had 73.44 ± 5.95 in GA while rising in SA with 82.27 ± 7.57. Anesthesia plays a pivotal role in the enhancement of surgical outcomes at patients in terms of the development of general health and quality of life.

Keywords: SF-36 General Health Quality of Life Questionnaire; Post-Operative Complications; Pain; Anesthesia Techniques (General, Spinal, and Local).

INTRODUCTION

In the twentieth century, there was a dramatic evolution of surgery involving surgical techniques, perioperative care, and anesthesia, all of which significantly alter patient outcomes (Baghel, P.S. *et al*., 2016; Bansal, H. *et al*., 2012). Among these key components is anesthesia; it remains one of the foundations of contemporary surgical management, applying to the comfort of the patient, the safety of the patient, and physiological stability during the performance of the surgical procedure (Burch, J. *et al*., 2009; Chen, J. & You, J., 2010; Dakubo, J.C.B. *et al*., 2015). However, anesthesia is not restricted just to the operating room; it can greatly affect postoperative recovery and long-term surgical outcomes (Ellen, S., 2017). The study of postoperative recovery has gained increasing importance, particularly with regard to understanding how the anesthetic techniques chosen might affect the trajectory of patient recovery (Eroglu, A. *et al*., 2015).

Postoperative recovery is indeed a pluralistic existence in a physical, psychological, and functional sense. It has to do with numerous factors, such as patient characteristics, the complexity of surgery, and all perioperative interventions (Formiga, F.B. *et al*., 2017). Anesthetics evidently play an important role in the recovery of parameters like pain management, cognitive function, and mobilization, and return to life activities (Gudaityte, J. *et al*., 2004). The options of using a regional form of anesthesia versus the general, multimodal analgesics, and enhanced recovery after surgery (ERAS) protocols were all related to better recovery outcomes (Hewitt-Smith, A. *et al*., 2018; Jinjil, K. *et al*., 2018).

Although advances are being made, issues remain in determining postoperative recovery as a whole and quantifying the role anesthesia has played. Traditional assessment tools like hospital length of stay and complication rate give only part of the picture, often not weighing the subtle influence of anesthesia on patient-reported outcomes and quality of life (Kumar, A. *et al*., 2017; Kushwaha, R. *et al*., 2008; Maloku, H. *et al*., 2014). Moreover, the heterogeneity of surgical populations and procedures requires specific anesthesia care approaches, further complicating the ability to assess its effect in recovery (Marshall, S.I. & Chung, F., 1999).

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PATIENTS AND METHODS

Study Design

We conducted a cross-sectional study of 112 patients with multiple diseases who underwent emergency surgery under anesthesia at hospitals in Baghdad, Iraq. Patients aged 20–60 years were recruited and followed for a year between March 2023 and May 2024. The specific objectives included 1) recording the patients' surgical characteristics and outcomes, 2) assessing the impact of anesthesia on intraoperative and postoperative outcomes, and 3) assessing the patient's general health and quality of life by comparing all anesthesia techniques used in surgery.

Inclusion and Exclusion Criteria

For the inclusion and exclusion criteria, this study included patients aged 20–60 years, smokers, obese patients, symptomatic and eating disorders, patients with other comorbidities (including hypertension, diabetes mellitus, asthma, and skin diseases), and patients with some of whom had undergone previous abdominal surgery. This study excluded patients, including those with disabilities, pregnant and lactating patients, and patients younger than 20 years and older than 60 years, patients with serious illnesses, patients with preoperative severe bleeding, and patients with osteoporosis.

Surgical Interventions and Anesthesia

All participating patients underwent multiple surgeries, and the clinical, demographic, and surgical characteristics of the 112 patients participating in this study were recorded. The types of surgeries performed on patients were identified, including hemorrhoids, kidney stones, and thyroidectomy. Our data included open hemorrhoidectomy (60 patients), kidney stone removal (30 patients), and total thyroidectomy (TT) (22 patients). Regarding the anesthesia used in the various surgeries, patients underwent three types of anesthesia for open hemorrhoidectomy: 17 under general anesthesia, 11 under regional anesthesia, and 32 under spinal anesthesia. Some patients underwent kidney stone removal: 10 under general anesthesia, 20 under spinal anesthesia, and all 22 patients undergoing total thyroidectomy (TT) under general anesthesia. For surgical outcomes, surgical data under anesthesia were recorded, including parameters such as operative time, the number of patients who experienced bleeding during the procedure, the percentage of patients admitted to the intensive care unit (ICU), blood loss rate, length of hospital stay, mortality rate, and complications. Our study recorded patients' postoperative satisfaction rates, which focused on the effect of anesthesia on surgery. This study also evaluated patients' pain rates during follow-up periods, which lasted 1st day, 3rd day, 6th day, and 1 week. Furthermore, the patient's general health and quality of life were assessed during the follow-up period using a general health questionnaire (SF-36) that assesses general health, including physical, psychological, emotional, social, and daily activity aspects. Using the SPSS 22.0 program, the statistical results and clinical characteristics of the patients were analyzed, and the anesthesia techniques used were compared.

RESULTS

Table 1: Demographics' characteristics of patients

Items	Characteristics	No. of patients {n = 112}	Percentage {%}
Age {Y}			
	20 – 30	14	12.5%
	31 – 40	21	18.75%
	41 – 50	42	37.5%
	> 50	35	31.25%
Sex			
	Male	76	67.86%
	Female	36	32.14%
Body mass index, {kg/m2}			
	Underweight	5	4.46%
	Normal Weight	12	10.71%
	Overweight	26	23.21%
	Obesity	69	61.61%
Current smoking			
	Present	61	54.46%

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	Absent	51	45.54%
ASA classification			
	I	51	45.54%
	II	36	32.14%
	III	25	22.32%
Comorbidities, %			
	No	38	33.93%
	Hypertension	31	27.68%
	Diabetes mellitus	22	19.64%
	Asthma	10	8.93%
	Skin diseases	6	5.36%
	Others	5	4.46%
Poor diet			
	Present	78	69.64%
	Never	34	30.36%
Previous abdominal surgery			
	Yes	23	20.54%
	No	89	79.46%
Marital status			
	Single	26	23.21%
	Married	79	70.54%
	Widow/Divorced	7	6.25%
Working status			
	Student	11	9.82%
	Employed	72	64.29%
	Non - workers	20	17.86%
	Retired	9	8.04%

Table 2: Identifying preoperative symptoms of patients

Items	Symptoms	Frequency, {n = 112}	%
Hemorrhoid		60	53.57%
	Pain	50	83.33%
	Itching	46	76.67%
	Swelling	24	40.00%
	Bleeding	29	48.33%
	Protrusion	11	18.33%
Kidney Stones		30	26.79%
	Painful urination	26	86.67%
	Blood in urine	11	36.67%
	Nausea and vomiting	13	43.33%
	Frequent urination	16	53.33%
	Foul-smelling urine	12	40.0%
	Fever and chills	14	12.5%
Hyperthyroidism		22	19.64%
	Weight loss	5	22.73%
	Irregular heartbeat	7	31.82%
	Anxiety	14	63.64%
	Heat intolerance	18	81.82%
	Tremors	4	18.18%
	Fatigue	18	81.82%
	Difficulty sleeping	17	77.27%
	Frequent bowel movements	16	72.73%
	Goiter	16	72.73%

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Table 3: Determining different techniques of anesthesia used in surgeries.

Surgeries	Anesthesia used	Frequency, {n = 92}	Percentage, %
Hemorrhoid		**60**	**53.57%**
	General, (GA)	17	28.33%
	Local, (LA)	11	18.33%
	Spinal, (SA)	32	53.33%
Kidney stone removal		**30**	**26.79%**
	General, (GA)	10	33.33%
	Spinal, (SA)	20	66.67%
Total thyroidectomy (TT)		**22**	**19.64%**
	General, (GA)	22	19.64%

Table 4: Surgical outcomes

Variables	GA	LA	SA
Operative time, min			
Open hemorrhoidectomy	42.2 ± 8.1	39.4 ± 3.7	37.5 ± 4.4
Kidney stone removal	46.4 ± 5.7	-	41.2 ± 3.8
Total thyroidectomy	61.5 ± 9.7	-	-
No. of bleeding			
Yes	8 (7.14%)	3 (2.68%)	1 (0.89%)
No	104 (92.86%)	109 (97.32%)	111 (99.11%)
ICU admission	5 (4.46%)	2 (1.79%)	1 (0.89%)
Blood loss, mL	705.64 ± 34.89	558.84 ± 12.70	693.45 ± 24.76
Length of stay in hospital, days	4.6 ± 2.2	2.3 ± 1.5	1.1 ± 0.22
Mortality rate			
Yes	4 (3.57%)	2 (1.79%)	0 (0%)
No	108 (96.43%)	110 (98.21%)	112 (100%)

Table 5: Assessment of clinical outcomes of post-operative pain in patients

Follow – up	GA	LA	SA	P - value
1st day	5.4 ± 2.8	3.5 ± 1.8	3.1 ± 1.0	2.18
3rd days	3.7 ± 0.8	2.6 ± 0.5	2.1 ± 0.4	4.91
6th day	2.6 ± 0.4	1.8 ± 0.3	1.0 ± 0.2	1.9
After 1 week	1.5 ± 0.7	0.9 ± 0.2	0.3 ± 0.1	2.22

Table 6: Postoperative complications of patients who underwent to surgery under GA, LA, and SA

Complications	GA		LA		SA	
	N	%	N	%	N	%
Open Hemorrhoidectomy	**6**	**5.36%**	**4**	**3.57%**	**3**	**2.68%**
Pain	1	0.89%	1	0.89%	0	0%
Bleeding	1	0.89%	1	0.89%	0	0%
Infection	1	0.89%	1	0.89%	1	0.89%
Urinary Retention	2	1.79%	0	0%	2	1.79%
Anal Stenosis	0	0%	0	0%	0	0%
Fecal Incontinence	0	0%	0	0%	0	0%
Recurrence	1	0.89%	1	0.89%	0	0%
Kidney Stones	**5**	**4.46%**	**Not use**		**2**	**1.79%**
Bleeding	1	0.89%	-	-	0	0%
Infection	1	0.89%	-	-	1	0.89%
Injury to Surrounding Organs	0	0%	-	-	0	0%
Urinary Leakage	1	0.89%	-	-	1	0.89%
Residual Stones	2	1.79%	-	-	0	0%
Ureteral Stricture	0	0%	-	-	0	0.00%

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Total Thyroidectomy	**7**	**6.25%**	**Not use**		**Not use**	
Hypocalcemia	2	1.79%	-	-	-	-
Bleeding	2	1.79%	-	-	-	-
Infection	1	0.89%	-	-	-	-
Recurrent Laryngeal Nerve Injury	0	0%	-	-	-	-
Hypothyroidism	1	0.89%	-	-	-	-
Tracheomalacia	1	0.89%	-	-	-	-
Total of complications	**18**	**16.07%**	-	-	-	-

Table 7: Assessment of general health quality of life in patients after surgery using SF – 36 questionnaire

Items	GA	LA	SA
Physical function	74.36 ± 7.68	85.44 ± 4.69	92.23 ± 2.34
Psychological function	70.88 ± 5.90	82.21 ± 4.56	87.71 ± 3.94
Social and emotional functions	68.35 ± 9.46	75.33 ± 6.77	80.11 ± 12.19
Daily activity	73.44 ± 5.95	79.67 ± 5.27	82.27 ± 7.57

DISCUSSION

It contradicts the very first comparison of anesthesia changes after surgery in terms of GA with SA and LA in the different types of surgery produced (Medina-Gallardo, A. *et al*., 2017). In this study, it has shown that there are differences in post-open hemorrhoidectomy pain occurrence measured with VAS in the two groups of patients; the results have shown differences in VAS assessments in post-OH for both groups. These results confirm that this open hemorrhoidectomy differs in LA versus SA and GA for OH in our area. This finding is quite similar to that finding in the United States, which found a similarity in average pain between post-hemorrhoidectomies done under LA versus GA during the 10-day follow-up (Park, J. *et al*., 2017; Resorlu, B. *et al*., 2012; Jeong, C.W. *et al*., 2013).

The outcomes of our assessment indicated that under general anesthesia, performed hemorrhoidectomies guarantee complete immobility without discomfort for the patient throughout the procedure; however, with a high risk of nausea and vomiting post-operation, as well as increased recovery time. The SA anesthetic applied was particularly for very good pain relief and prevents systemic effects of general anesthesia (Dindo, D. *et al*., 2004). Also, it is usually preferred for hemorrhoidectomy due to its affectivity in pain management and rapid recovery compared to general methods. Further, we found local anesthesia also showed a minimum systemic effect, very rapid recovery, and lower-cost procedures. It limits itself to very superficial or minimally invasive techniques.

Eighteen-point-five percent, as determined, of all TT procedures in the United States were carried out by a high-volume surgeon; almost one-third of cases in this study were performed by low-volume surgeons, particularly in the southern United States. This analysis indicates a group of surgeons for whom complication, mortality, and charge rates are grossly overstated, even controlling for coexistent comorbidity for their patients (Emiliani, E. *et al*., 2016; Karacalar, S. *et al*., 2009). Concerning both specific complications and general ones, only four conditions for post-thyroidectomy complications were influenced by specific surgeon volumes: hematoma in the neck postoperatively, hypocalcemia, tracheomalacia, and paralysis in the vocal folds. However, the 1.23% combined nerve injury rate in TT is surely almost an underestimate with regard to the real number. Underlying hidden or latent injury to the nerve may be the reason for the evidence being delayed in emerging as objectively indicative. For the total thyroidectomy procedure under general anesthesia, it is critical to allow for airway control and immobility of the patient during surgery of the neck, and it risked being post-operatively sore throated and nauseous with prolonged recovery. Since such surgery must have access and airway precision, total thyroidectomy is standard (Kuzgunbay, B. *et al*., 2009; Singh, V. *et al*., 2011).

Many times, the safety and efficacy of SA compared with that of GA during the removal of kidney stones have been reported. Our research provides evidence that spinal anesthesia with intravenous patient-controlled sedation can be an alternative for GA. There was a significant increase in nausea and antiemetics in GA, while patients under SA had better satisfaction and lower pain scores after GA (Buldu, I. *et al*., 2016; Dunn, J.T., 2002; Desault, P.J., 1792). This signifies that SA does not evaluate the efficacy and safety of

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patients. Patients after SA reported using lesser administration of analgesics with longer hospital stays. It is safe and effective under SA and GA, even in kidney stone treatment. Some of these studies reported GA as a risk factor for renal dysfunction even after non-urologic surgeries. There were increases in overall mortality, cardiopulmonary complications, and renal failure after SA (Becker, W.F., 1977; Kocher, T., 1874).

CONCLUSION

In conclusion, anesthesia has a significant impact on the surgical outcomes of patients undergoing hemorrhoidectomy, nephrolithotomy, and thyroidectomy procedures. Adequate pain relief, physiological homeostasis, and intraoperative stress reduction through anesthetic techniques are post-operative comfort boosters in terms of morbidity minimization and speeding up of recovery. Individualized anesthesia protocols that take into consideration specific patient factors and surgical requirements can only yield optimal results. There can be no doubt, however, that future refinements in anesthesia will continue to find their place in surgical care as indispensable means of improving patient safety and satisfaction and increasing the overall quality of life.

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