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ORIGINAL ARTICLE

Comparison of surgical outcomes between consultant and residents general surgeons after elective abdominal procedures.

Shahid Khan[1], Aurangzeb Ahmad[2], Ahmad Zeb[3], Aurang Zeb[4], Hamd Ullah[5], Shahkar Ali Khan[6]

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ABSTRACT… Objective: To compare surgical outcomes after elective abdominal surgeries between consultant and supervised resident general surgeons. **Study Design:** Cross Sectional study. **Setting:** Department of General Surgery, HMC, MTI Peshawar. **Period:** March 2023 to September 2023. **Methods:** Included 129 patients undergoing elective abdominal surgeries. Patients aged 18-70 years were included, while emergency procedures, pregnant patients, abdominal trauma cases, and surgeries by junior residents were excluded. Preoperative data, including patient demographics and clinical characteristics, were collected. Surgeries were performed by consultants or 4th year resident under supervision. Postoperative complications were monitored for 30 days. **Results:** The study population comprised 55.8% females and 44.2% males, with a mean age of 39±10.9 years. Consultants performed 49.6% of surgeries, while residents performed 50.4%. Mesh hernia repair was the most common procedure (50.4%). Surgical site infection was the most frequent complication (13.2%), followed by readmission (3.1%) and return to OR (2.3%). No statistically significant differences in complication rates were found between consultant and resident surgeons (all p-values > 0.05). **Conclusion:** The study demonstrates comparable postoperative complication rates between consultant and resident surgeons, highlighting the effectiveness of supervised surgical training in maintaining high standards of patient care. Direct supervision plays a crucial role in developing residents' skills while ensuring patient safety.

Key words: Consultant Surgeons, Elective Abdominal Surgery, Postoperative Complications, Resident Surgeons, Surgical Outcomes.

INTRODUCTION

Surgical training programs worldwide face the ongoing challenge of balancing optimal patient care with the educational needs of surgical residents.[1,2] The acquisition of surgical competence through hands-on experience is fundamental to residency training, yet concerns about patient safety and surgical outcomes when procedures are performed by residents continue to generate debate within the medical community (Krell et al., 2014; Wojcik et al., 2021).[3,4] This discourse has become increasingly relevant as healthcare systems globally emphasize quality metrics, patient safety, and cost-effectiveness.[5]

The traditional apprenticeship model of surgical education, where residents progressively assume greater operative responsibilities under supervision, has been the cornerstone of surgical training for generations.[6] However, in today's evidence-based medical environment, it is crucial to validate this approach through rigorous comparative analysis of surgical outcomes.[7] Previous studies have yielded varying results, with some suggesting comparable outcomes between resident and consultant surgeons, while others indicate subtle differences in specific procedural metrics.[8]

Elective abdominal procedures represent an ideal context for such comparison, as they encompass a wide range of surgical complexity and are commonly performed by both consultants and residents under supervision.[9]

1. MBBS, TMO General Surgery, Khyber Teaching Hospital, Peshawar.
2. MBBS, TMO General Surgery, Hayatabad Medical Complex, Peshawar.
3. MBBS, FCPS, Professor Paediatric Surgery, Naseer Teaching Hospital, Peshawar.
4. MBBS, FCPS, Professor Anaesthesia, Naseer Teaching Hospital, Peshawar.
5. MBBS, FCPS, Senior Registrar, Kabir Teaching Hospital, Peshawar.
6. MBBS, FCPS, Senior Registrar General Surgery, Saidu Group of Teaching Hospital.

Correspondence Address:
Dr. Aurangzeb Ahmad
Department of General Surgery
Hayatabad Medical Complex, Peshawar.
zebahmad12345@gmail.com

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These procedures, including laparoscopic cholecystectomies, hernia repairs, and elective laparotomies, form a substantial portion of general surgical practice and are essential components of resident training.[1] Furthermore, their elective nature allows for standardized preoperative preparation and risk assessment, making them particularly suitable for comparative analysis.[10]

Recent literature has examined various aspects of surgical outcomes, including operative time, complication rates, length of stay, and readmission rates.[4,11] However, many studies have been limited by small sample sizes, single-institution bias, or focus on specific procedures rather than a comprehensive analysis of abdominal surgery.[12] Additionally, the impact of surgical experience on patient outcomes continues to evolve with the introduction of new surgical techniques and technologies.[13]

This study aimed to comprehensively compare surgical outcomes between consultant surgeons and residents in elective abdominal procedures at our institution. By analysing a range of parameters including postoperative complications, mortality rates, readmissions, and returns to the operating room, we seek to provide evidence-based insights into the safety and efficacy of resident-performed surgeries. Understanding these outcomes is crucial not only for optimizing patient care but also for refining surgical training programs and ensuring the continued development of competent future surgeons.

OBJECTIVE

To compare the surgical outcomes after elective abdominal surgeries among consultant and resident general surgeons

METHODS

A cross sectional study was conducted after approval from ethical review committee of hospital (IRB No:HMC/QAD-2011). Total of 129 patients admitted in general surgery unit Hayatabad Medical Complex, Peshawar from March 2023 to September 2023 undergone elective general surgery procedures were included in the study. 32 patients were excluded based on exclusion criteria. The sampling technique was nonprobability consecutive. Informed written consents were taken from the patients/guardians. Patient were prepared for general surgery procedure based on ward protocol. Procedures were performed by consultant general surgeons and resident surgeons under supervision of consultant surgeon (4th year post graduate year). Preoperatively data included age, gender, type of procedure, American society of anaesthesiology (ASA) class, steroid usage, diabetes, presence of cancer, hypertension, dyspnoea and smoking status. Patient underwent elective abdominal general surgery procedure. Post operatively patients were followed for duration of 30 days and post operative complications if any were noted.

SAMPLE SELECTION

Inclusion Criteria

All patients aged 18 to 70 years, admitted in general surgery unit for elective abdominal surgeries on elective list were included in the study irrespective of gender and ethnicity.

Exclusion Criteria

Emergency general surgery procedures, pregnant patient, abdominal trauma cases, surgeries performed by junior residents (Year 1, 2 and 3 residents), unsupervised surgeries by residents and non-abdominal general surgery cases were excluded.

RESULTS

Total of 129 patients were included in the study. The mean age of patients was 39±10.9 yrs. The Table-I provides a detailed breakdown of patient characteristics and clinical variables. In terms of gender, there were 72 females (55.8%) and 57 males (44.2%). Regarding the type of surgeon, 64 surgeries (49.6%) were performed by consultants, while 65 surgeries (50.4%) were performed by residents. For the types of surgeries performed, 19 (14.7%) were elective laparotomies, 29 (22.5%) were laparoscopic cholecystectomies, 65 (50.4%) were mesh hernia repairs, and 16 (12.4%) were appendectomies. The ASA classification showed that 88 (68.2%) were healthy, 32 (24.8%) had mild systemic disease, 7 (5.4%) had severe systemic disease,

and 2 (1.6%) had severe systemic disease with a threat to life. Steroid use for chronic conditions was noted in 3 (2.3%), while 126 (97.7%) did not use steroids. Diabetes was present in 7 (5.4%), with the remaining 122 (94.6%) being non-diabetic. Systemic sepsis within 48 hours prior to surgery was absent in 106 (82.2%), while 20 (15.5%) had SIRS, and 3 (2.3%) had sepsis. Disseminated cancer was found in 6 (4.7%), whereas 122 (94.6%) did not have disseminated cancer, and 1 (0.8%) had a unique code of 22.001. Hypertension requiring medication was present in 23 (17.8%), with 106 (82.2%) not requiring such medication. Regarding dyspnea, 114 (88.4%) had no dyspnea, 13 (10.1%) experienced dyspnea with moderate exertion, and 2 (1.6%) had dyspnea at rest. Finally, smoking within the past year was reported by 3 (2.3%), while 126 (97.7%) were non-smokers.

The Figure-1, highlights that Surgical Site Infection has the highest occurrence at 13.2%, followed by Readmission at 3.1%, Return to OR at 2.3%, and Pneumonia, Cardiac Complication, and Death all at 0.8%

Table-II demonstrate the comparison of surgical outcomes among surgeon categories. Pneumonia occurred in 1 patient (1.5%) operated on by a resident, with no cases in those operated on by consultants. Cardiac complications were also seen in 1 patient (1.5%) under the care of a resident, and none in the consultant group. Surgical site infections were more frequent, occurring in 6 patients (9.4%) operated on by consultants and 11 patients (16.9%) operated on by residents. Urinary tract infections and venous thromboembolism each occurred in 1 patient (1.5%) under the care of a resident, with none in the consultant group. Readmissions were slightly more common among patients operated on by consultants, with 3 patients (4.7%) compared to 1 patient (1.5%) in the resident group. The need for return to the operating room was noted in 2 consultant cases (3.1%) and 1 resident case (1.5%). Lastly, death occurred in 1 patient (1.5%) operated on by a resident and none in the consultant group. The p-values for all complications indicate no statistically significant differences between the two groups.

Variables	n (%)
Gender	
Female	72 (55.8%)
Male	57 (44.2%)
Surgeon	
Consultant	64 (49.6%)
Resident	65 (50.4%)
Surgery done	
Elective Laparotomy	19 (14.7%)
Laparoscopic Cholecystectomy	29 (22.5%)
Mesh Hernia Repair	65 (50.4%)
Appendectomy	16 (12.4%)
ASA Class	
Healthy	88 (68.2%)
Mild Systemic Disease	32 (24.8%)
Severe Systemic Disease	7 (5.4%)
Severe + threat to life	2 (1.6%)
Steroid Use for Chronic Condition	
Yes	3 (2.3%)
No	126 (97.7%)
Diabetes	
Yes	7 (5.4%)
No	122 (94.6%)
Systemic Sepsis within 48hrs prior to Surgery	
None	106 (82.2%)
SIRS	20 (15.5%)
Sepsis	3 (2.3%)
Disseminated Cancer	
Yes	6 (4.7%)
No	123 (95.4%)
Hypertension requiring Medication	
Yes	23 (17.8%)
No	106 (82.2%)
Dyspnea	
None	114 (88.4%)
With Moderate Exertion	13 (10.1%)
Rest	2 (1.6%)
Smoking within 1 year	
Yes	3 (2.3%)
No	126 (97.7%)

Table-I. Clinicodemographic variables of patients

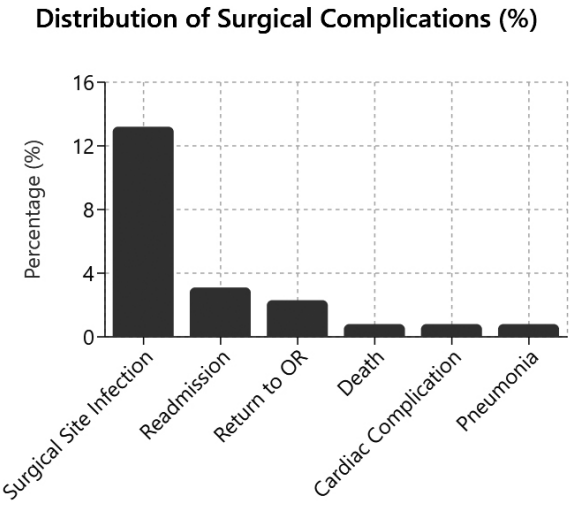

Figure-1. Observed complications

DISCUSSION

Our analysis encompassed a diverse range of surgical procedures, with mesh hernia repairs constituting the majority (50.4%, n=65), followed by laparoscopic cholecystectomies (22.5%, n=29), elective laparotomies (14.7%, n=19), and appendectomies (12.4%, n=16). This distribution aligns with the surgical case mix reported in comparable studies suggesting a representative sample of general surgical procedures.[1,14]

The patient population predominantly comprised healthy individuals (ASA I: 68.2%, n=88), with decreasing proportions of patients with mild systemic disease (ASA II: 24.8%, n=32), severe systemic disease (ASA III: 5.4%, n=7), and severe systemic disease with life threat (ASA IV: 1.6%, n=2). This ASA classification distribution mirrors the findings of Mirbagheri et al. (2010),[14] indicating a typical patient risk profile for elective and semi-elective general surgery. The prevalence of diabetes in our cohort was 5.4% (n=7), consistent with observations by Hassan et al. (2022).[15]

Regarding postoperative complications, our analysis revealed several noteworthy patterns when comparing outcomes between consultant-led and resident-led surgeries. Cardiopulmonary complications were rare, with one case of pneumonia and one cardiac complication (1.5% each) occurring exclusively in the resident group, corroborating the findings of Hassan et al. (2022).[15]

Complication		Consultant (n=64)	Resident (n=65)	Total (n=129)	P-Value
Pneumonia	Yes	0	1	1	1.000*
	No	64	64	128	
Cardiac Complication	Yes	0	1	1	1.000*
	No	64	64	128	
Surgical Site Infection	Yes	6	11	17	0.298*
	No	58	54	112	
Urinary Tract Infection	Yes	0	1	1	1.000*
	No	64	64	128	
Venous Thromboembolism	Yes	0	1	1	1.000*
	No	64	64	128	
Readmission	Yes	3	1	4	0.365*
	No	61	64	125	
Return to OR	Yes	2	1	3	0.619*
	No	62	64	126	
Death	Yes	0	1	1	1.000*
	No	64	64	128	

Table-II. Comparison of surgical outcomes among consultant and resident surgeon

*Fisher's exact test was used for comparison

Surgical site infections (SSIs) emerged as the most frequent complication, with a higher incidence in resident-led operations (16.9%, n=11) compared to consultant-led procedures (9.4%, n=6). While this trend aligns with observations by Alemayehu et al. (2023), it differs from the outcomes reported by Siam et al. (2017).[1,10]

Other postoperative complications occurred infrequently, with single cases (1.5%) of urinary tract infection and venous thromboembolism observed only in the resident group, consistent with the complication rates reported by Krell et al. (2014).[3] Readmission rates showed a slight variation, with consultant-led cases experiencing a marginally higher rate (4.7%, n=3) compared to resident-led cases (1.5%, n=1). Similarly, return to operating room rates were comparable between consultants (3.1%, n=2) and residents (1.5%, n=1), findings that parallel those of Siam et al. (2017).[10]

Mortality analysis revealed one death (1.5%) in the resident group, with no mortalities in the consultant group, comparable to outcomes reported by Mehta et al. (2017).[16]

However, it is crucial to note that statistical analysis demonstrated no significant differences in complication rates between consultant-led and resident-led surgeries across all measured outcomes. This finding reinforces previous observations by Siam et al. (2017)[10], Graat et al. (2012)[17], and Mizrahi[18], though it contrasts with the results reported by Kauvar et al. (2006).[12]

These results suggest that, under appropriate supervision and within established training frameworks, resident-performed surgeries maintain comparable safety profiles to consultant-led procedures. This conclusion has important implications for surgical training programs and healthcare delivery systems, supporting the continued development of surgical residents through hands-on operative experience while maintaining acceptable patient safety standards.

CONCLUSION

This study demonstrates that the rates of postoperative complications were similar between surgeries performed by consultant surgeons and those performed by Resident surgeons under direct supervision. This similarity in outcomes highlights the vital role of direct supervision in the training of surgical residents.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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AUTHORSHIP AND CONTRIBUTION DECLARATION	
1	**Shahid Khan:** Manuscript writing, drafting, analysis, proof reading.
2	**Aurangzeb Ahmad:** Manuscript writing, data analysis, data collection, proof reading.
3	**Ahmad Zeb:** Manuscript writing, data analysis, data collection, proof reading.
4	**Aurang Zeb:** Manuscript writing, data analysis, drafting, proof reading.
5	**Hamd Ullah:** Manuscript writing, data analysis, data collection, proof reading.
6	**Shahkar Ali Khan:** Manuscript writing, data analysis, data collection, proof reading.