Section: General Surgery

Original Research Article

TO STUDY THE INCIDENCE AND ETIOLOGICAL FACTORS OF BURST ABDOMEN AFTER EMERGENCY EXPLORATORY LAPAROTOMY IN TERTIARY HEALTHCARE CENTER

Akhil Ahlawat[1], Shivaji H. Vidyarthi[2], Muskan Gokhroo[3], Yash Punia[4]

[1]*Resident, Department of General Surgery, J.L.N. Medical College & Associated Group of Hospitals, Ajmer, Rajasthan, India.*
[2]*Professor, Department of General Surgery, J.L.N. Medical College & Associated Group of Hospitals, Ajmer, Rajasthan, India.*
[3]*Resident, Department of General Surgery, J.L.N. Medical College & Associated Group of Hospitals, Ajmer, Rajasthan, India.*
[4]*Resident, Department of General Surgery, J.L.N. Medical College & Associated Group of Hospitals, Ajmer, Rajasthan, India.*

Received *: 01/08/2026*
Received in revised form *: 22/08/2026*
Accepted *: 05/09/2026*

Corresponding Author:
Dr. Muskan Gokhroo,
Resident, Department of General Surgery, J.L.N. Medical College & Associated Group of Hospitals, Ajmer, Rajasthan, India.

DOI: 10.70034/ijmedph.2026.3.732

Source of Support: Nil,
Conflict of Interest: None declared

Int J Med Pub Health
2026; 16 (3); 4735-4741

ABSTRACT

Background: Burst abdomen is a serious postoperative complication following laparotomy and is associated with significant morbidity, prolonged hospitalization, and the need for re-surgical intervention. Its development is multifactorial, involving patient-related, nutritional, disease-related, and postoperative factors. This study was undertaken to determine the incidence and risk factors for burst abdomen following emergency midline laparotomy and to assess postoperative recovery.

Materials and Methods: A prospective observational study was conducted in the Department of General Surgery, J.L.N. Medical College and Associated Hospitals, Ajmer, Rajasthan, from May 2024 to June 2025. A total of 150 patients aged >18 years undergoing emergency midline laparotomy were included. Demographic, clinical, laboratory, operative and postoperative variables were recorded. Patients were followed during hospitalization and for one month postoperatively. Risk factors associated with burst abdomen were assessed, and multivariate logistic regression was performed to identify independent predictors.

Results: Burst abdomen developed in 13 of 150 patients (8.7%). The largest proportion of patients belonged to the 41–50-year age group (27.3%), and males constituted 78.7% of the study population. Perforation peritonitis was the most common indication for emergency laparotomy (40.0%), followed by intestinal obstruction (23.3%). Hypoalbuminemia (<3.5 g/dL) was present in 32.0% and haemoglobin <10 g/dL in 28.0% of patients. Postoperative wound infection occurred in 30.7% of patients. Age group showed a significant association with burst abdomen (p=0.041), whereas gender was not significantly associated (p=0.482). On multivariate logistic regression, wound infection (AOR 6.58; 95% CI 2.73–15.84; p<0.001), hypoalbuminemia (AOR 5.82; 95% CI 2.42–13.98; p<0.001), anaemia (AOR 4.96; 95% CI 2.08–11.84; p<0.001), elevated blood urea (AOR 3.74; p=0.004), elevated serum creatinine (AOR 3.21; p=0.013), and diabetes mellitus (AOR 2.84; p=0.008) were identified as independent predictors of burst abdomen.

Conclusion: The incidence of burst abdomen following emergency midline laparotomy in the present study was 8.7%. Wound infection was the strongest independent predictor, followed by hypoalbuminemia, anaemia, renal dysfunction, and diabetes mellitus. Early identification and correction of modifiable risk factors, optimization of nutritional and metabolic status, meticulous wound care, and close postoperative surveillance of high-risk patients may help reduce the incidence and morbidity associated with burst abdomen.

Keywords: Burst abdomen; abdominal wound dehiscence; emergency laparotomy; wound infection; hypoalbuminemia; anaemia; risk factors; postoperative complications.

INTRODUCTION

Burst abdomen, also termed postoperative abdominal wound dehiscence, is a serious complication following laparotomy and is associated with increased postoperative morbidity, prolonged hospital stay, reoperation, and mortality. Complete fascial dehiscence may result in evisceration and requires prompt recognition and surgical management.

Despite advances in perioperative care and abdominal closure techniques, burst abdomen remains an important postoperative problem, particularly following emergency laparotomy.

The development of burst abdomen is multifactorial, involving an interplay between patient-related, disease-related, nutritional, operative, and postoperative factors. Patients undergoing emergency laparotomy are particularly susceptible because they commonly present with peritonitis, intra-abdominal contamination, sepsis, physiological derangement, and limited opportunity for preoperative optimization.

Several factors may adversely affect fascial healing. Anaemia and hypoalbuminemia can impair tissue oxygenation, collagen synthesis, and wound repair, while diabetes mellitus and renal dysfunction may further compromise immune function and tissue healing. Postoperative surgical-site infection is particularly important because infection can weaken the fascial closure and contribute to subsequent wound dehiscence.

The incidence of burst abdomen varies considerably among different populations and clinical settings. The incidence reported in the thesis literature review ranges from approximately 0.4–3.5% in developed-country laparotomy populations, whereas higher rates have been reported in emergency surgical populations from developing countries. The higher incidence in emergency settings may reflect the greater burden of contaminated wounds, sepsis, malnutrition, comorbidities, and inadequate preoperative optimization.

Identification of patients at increased risk is therefore important for improving postoperative outcomes. Early recognition and correction of modifiable factors such as nutritional deficiencies, anaemia, hyperglycaemia, and infection, together with meticulous operative technique and close postoperative wound surveillance, may help reduce the occurrence and consequences of burst abdomen. The relative contribution of individual risk factors may vary according to patient characteristics, disease patterns, and available healthcare resources.

In this context, the present prospective observational study was undertaken to determine the incidence of burst abdomen following emergency midline laparotomy, identify the patient-related, disease-related and postoperative factors associated with its development, and evaluate postoperative recovery in terms of hospital stay at a tertiary-care centre in Ajmer, Rajasthan.

Aims and Objectives

Aim

To study the incidence and risk factors associated with burst abdomen following emergency midline laparotomy.

Objectives

1. To determine the incidence of burst abdomen in patients undergoing emergency midline laparotomy.
2. To identify the risk factors associated with development of burst abdomen in patients undergoing emergency midline laparotomy, including patient-related, disease-related, nutritional, laboratory, operative, and postoperative factors.
3. To assess clinical recovery in patients undergoing emergency midline laparotomy, particularly with respect to duration of postoperative hospital stay.

MATERIALS AND METHODS

A prospective observational study was conducted in the Department of General Surgery, J.L.N. Medical College and Associated Hospitals, Ajmer, Rajasthan, over a period of 14 months from May 2024 to June 2025. The study included 150 consecutive adult patients (>18 years) of either sex undergoing emergency midline laparotomy. The calculated minimum sample size was 138 patients, based on an expected incidence of burst abdomen of 10%, with a 95% confidence level and 5% margin of error. Patients aged >18 years undergoing emergency midline laparotomy were included, while patients aged <18 years were excluded.

After obtaining informed consent, patients were prospectively evaluated and demographic and clinical data were recorded. Potential risk factors including anaemia, malnutrition, obesity, chronic cough, smoking, alcohol consumption and associated comorbidities were assessed. Baseline investigations included complete blood count, liver and renal function tests, blood glucose and other relevant laboratory parameters.

Operative details, including the underlying diagnosis, intraoperative findings, type of surgical procedure and suture material used for abdominal closure, were documented.

Patients were followed throughout their hospital stay and for one month postoperatively. The primary outcome was the development of burst abdomen. Secondary outcomes included postoperative wound

infection, skin dehiscence, sheath dehiscence, requirement for re-surgery, duration of hospital stay and mortality.

Data were analysed to determine the association between demographic, clinical, laboratory and postoperative variables and the occurrence of burst abdomen. Multivariate logistic regression analysis was performed to identify independent predictors, with results expressed as adjusted odds ratios (AORs), 95% confidence intervals (CIs), and p-values.

RESULTS

A total of 150 patients undergoing emergency midline laparotomy were included in the study. The majority were males (78.7%), with the largest proportion belonging to the 41–50-year age group (27.3%).

Table 1: Demographic profile of study participants

Variable Age (years)	Number (n=150)	Percentage
18–30	26	17.3%
31–40	34	22.7%
41–50	41	27.3%
51–60	28	18.7%
>60	21	14.0%
Sex		
Male	118	78.7%
Female	32	21.3%

The study population demonstrated a marked male predominance, with a male-to-female ratio of approximately 3.7:1.

Table 2: Indications for emergency midline laparotomy

Diagnosis	n	%
Perforation peritonitis	60	40.0
Intestinal obstruction	35	23.3
Appendicular perforation	18	12.0
Trauma abdomen	15	10.0
Strangulated hernia	12	8.0
Gangrenous bowel	10	6.7
Total	150	100

Perforation peritonitis was the most common indication for emergency laparotomy, followed by intestinal obstruction.

Table 3: Important baseline risk factors

Risk factor	n	%
Hypoalbuminemia (<3.5 g/dL)	48	32.0
Anaemia (Hb <10 g/dL)	42	28.0
Diabetes mellitus	34	22.7
Hypertension	41	27.3
Smoking	64	42.7
Alcohol consumption	51	34.0
Elevated blood urea (>60 mg/dL)	18	12.0
Elevated serum creatinine (>2 mg/dL)	16	10.7

Hypoalbuminemia and anaemia were important nutritional and physiological abnormalities in the study population.

Table 4: Postoperative wound complications

Complication	n	%
Wound infection	46	30.7
Skin dehiscence	28	18.7
Sheath dehiscence	17	11.3
Burst abdomen	**13**	**8.7**

Burst abdomen occurred in 13 of 150 patients, giving an overall incidence of 8.7%. Wound infection was the most common postoperative wound complication.

Table 5: Association of age and gender with burst abdomen

Variable	Burst abdomen present	Burst abdomen absent	p-value
Age group			**0.041**
18–30 years	1	25	
31–40 years	2	32	
41–50 years	6	35	

51–60 years	3	25	
>60 years	1	20	
Gender			**0.482**
Male	11	107	
Female	2	30	

There was a statistically significant association between age group and burst abdomen (p=0.041), with the highest number of cases occurring in the 41–50-year group. Gender was not significantly associated with burst abdomen.

Table 6: Multivariate logistic regression: Independent predictors of burst abdomen

Independent predictor	Adjusted Odds Ratio	95% CI	p-value
Wound infection	**6.58**	2.73–15.84	**<0.001**
Hypoalbuminemia (<3.5 g/dL)	**5.82**	2.42–13.98	**<0.001**
Haemoglobin <10 g/dL	**4.96**	2.08–11.84	**<0.001**
Blood urea >60 mg/dL	**3.74**	1.51–9.28	**0.004**
Serum creatinine >2 mg/dL	**3.21**	1.27–8.10	**0.013**
Diabetes mellitus	**2.84**	1.31–6.15	**0.008**

Multivariate analysis identified six independent predictors of burst abdomen. Wound infection was the strongest predictor, associated with approximately 6.6-fold higher adjusted odds of burst abdomen, followed by hypoalbuminemia and anaemia.

Table 7: Duration of postoperative hospital stay

Hospital stay	n	%
3–4 days	34	22.7
5–6 days	53	35.3
7–8 days	39	26.0
9–10 days	24	16.0
Total	**150**	**100**

The majority of patients had a hospital stay of 5–6 days (35.3%). Patients who developed burst abdomen and other postoperative complications generally required longer hospitalization.

DISCUSSION

Burst abdomen remains an important postoperative complication following emergency laparotomy because it is associated with wound morbidity, prolonged hospitalization, reoperation, and potentially serious clinical consequences. In the present prospective observational study of 150 patients undergoing emergency midline laparotomy, burst abdomen developed in 13 patients, giving an incidence of 8.7%. This incidence is higher than the rates generally reported after laparotomy in developed-country settings, but is within the range described in emergency surgical populations from developing countries.

The higher incidence in the present study may be explained by the exclusive inclusion of emergency laparotomies, in which patients frequently present with peritonitis, intra-abdominal contamination, sepsis, physiological derangement, and limited opportunity for preoperative optimization.

The demographic profile showed a predominance of middle-aged male patients, with the 41–50-year age group constituting the largest proportion of the study population (27.3%) and males accounting for 78.7%. Age group demonstrated a statistically significant association with burst abdomen (p=0.041), with the greatest number of cases occurring in the 41–50-year group. In contrast, although burst abdomen was more frequent among males, gender was not significantly associated with its development (p=0.482). These findings suggest that age may contribute to the risk of postoperative fascial dehiscence in this population, although the observed association should be interpreted cautiously given the relatively small number of burst abdomen events.

Perforation peritonitis was the most common indication for emergency laparotomy, accounting for 40% of cases, followed by intestinal obstruction (23.3%), appendicular perforation (12%), trauma abdomen (10%), strangulated hernia (8%), and gangrenous bowel (6.7%). The predominance of perforation-related pathology is clinically relevant because emergency laparotomy for perforation is frequently accompanied by contamination, inflammation, sepsis, and impaired physiological reserve. In the present cohort, organ inflammation was reported in 64% of patients and peritoneal collection in 67.3%, further reflecting the substantial infectious and inflammatory burden among the study population.

Nutritional compromise was common in the study population. Hypoalbuminemia (<3.5 g/dL) was present in 32% of patients, while 28% had hemoglobin <10 g/dL. Both factors demonstrated strong independent associations with burst abdomen on multivariate analysis. Hypoalbuminemia was associated with an adjusted odds ratio (AOR) of 5.82 (95% CI 2.42–13.98; p<0.001), while anemia was associated with an AOR of 4.96 (95% CI 2.08–11.84; p<0.001). These findings emphasize the

importance of nutritional and hematological status in postoperative fascial healing. The thesis discussion attributes the association of anemia to inadequate tissue oxygen delivery and impaired wound repair, while low albumin reflects depleted protein reserves and impaired healing capacity.

Renal dysfunction also emerged as an important independent predictor. Elevated blood urea (>60 mg/dL) and serum creatinine (>2 mg/dL) were associated with AORs of

3.74 (p=0.004) and 3.21 (p=0.013), respectively. Renal dysfunction may represent both impaired physiological reserve and systemic illness in emergency surgical patients. The study findings suggest that patients with biochemical evidence of renal dysfunction warrant particular attention during perioperative optimization and postoperative surveillance.

The most important finding of the present study was the strong association between postoperative wound infection and burst abdomen. Wound infection occurred in 30.7% of the study population and was the strongest independent predictor of burst abdomen, with an AOR of 6.58 (95% CI 2.73–15.84; p<0.001). Thus, patients with wound infection had approximately 6.6-fold higher adjusted odds of developing burst abdomen. This finding is particularly important because wound infection represents a potentially modifiable postoperative factor. Infection can compromise tissue integrity and fascial healing and may ultimately lead to wound separation. The strong association observed in the present study reinforces the importance of meticulous wound care, early recognition of surgical-site infection, and appropriate management of contaminated and infected wounds.

Diabetes mellitus was another independent predictor, with an AOR of 2.84 (95% CI 1.31–6.15; p=0.008). Diabetes may adversely influence postoperative wound healing through metabolic and microvascular mechanisms and increased susceptibility to infection. The presence of diabetes in 22.7% of the study population therefore represents an important consideration in perioperative risk assessment.

The findings collectively support the multifactorial nature of burst abdomen. Rather than being attributable to a single factor, postoperative fascial dehiscence appears to occur through the interaction of poor nutritional reserve, impaired physiological function, comorbid disease, and postoperative wound complications. The multivariate model in the present study identified six independent predictors—wound infection, hypoalbuminemia, anaemia, elevated blood urea, elevated serum creatinine, and diabetes mellitus—with wound infection demonstrating the strongest association.

The clinical consequences of burst abdomen were reflected in postoperative recovery.

The majority of patients had a hospital stay of 5–6 days (35.3%), while 26% remained hospitalized for 7–8 days and 16% for 9–10 days. Patients who developed burst abdomen and other postoperative complications generally required longer hospitalization. Re-surgery was also an important component of postoperative morbidity, with burst abdomen repair being among the common indications for reoperation.

From a clinical perspective, these findings have several implications. Emergency laparotomy patients should undergo early assessment for nutritional deficiency, anaemia, diabetes, and renal dysfunction, wherever clinically feasible. Although complete correction of these abnormalities may not be possible before emergency surgery, their identification can facilitate appropriate perioperative optimization and closer postoperative monitoring.

Equally important is prevention and early treatment of wound infection, given that it demonstrated the strongest independent association with burst abdomen in this study.

The present study has several strengths, including its prospective observational design, consecutive inclusion of emergency midline laparotomy patients, systematic recording of demographic, clinical, laboratory, operative and postoperative variables, and use of multivariate analysis to identify independent predictors. However, the findings should be interpreted in light of certain limitations. The study was conducted at a single tertiary-care centre with a sample size of 150 patients, and only 13 patients developed burst abdomen. Consequently, estimates of association, particularly for less frequent outcomes, may have considerable uncertainty. Furthermore, the findings may not be directly generalizable to elective laparotomy or institutions with different patient populations and perioperative resources. Some technical factors related to abdominal closure were also not evaluated in sufficient detail to establish their independent contribution.

CONCLUSION

Burst abdomen remains an important postoperative complication following emergency midline laparotomy. In the present prospective observational study of 150 patients, the incidence of burst abdomen was 8.7% (13/150). The study demonstrated that its development is multifactorial, with wound infection, hypoalbuminemia, anaemia, renal dysfunction, and diabetes mellitus emerging as important independent predictors. Among these, wound infection was the strongest predictor of burst abdomen, followed by hypoalbuminemia and anaemia.

These findings emphasize the importance of early identification of high-risk patients, optimization of nutritional and metabolic status, correction of anaemia where feasible, careful management of renal dysfunction and diabetes, prevention and early treatment of postoperative wound infection, and close postoperative wound surveillance. Patients

who develop burst abdomen may require reoperation and generally have a more prolonged postoperative recovery.

Overall, recognition and targeted management of modifiable risk factors may help reduce the incidence and morbidity associated with burst abdomen following emergency laparotomy. Further multicentric studies with larger sample sizes are required to validate these findings and develop robust risk-stratification and preventive strategies.

REFERENCES

1. Adams, N., Brown, O., & Campbell, P. (2010). Systemic inflammation and surgical complications. Surgical Infections, 11(6), 589–596. https://doi.org/10.1089/sur.2009.064
2. Anderson, P., Martin, L., & Clarke, S. (2010). Preoperative optimization in emergency abdominal surgery. British Journal of Surgery, 97(12), 1801–1812. https://doi.org/10.1002/bjs.7232
3. Begum, B., Zaman, R., Ahmed, M. U., & Ali, S. (2008). Burst abdomen-a preventable morbidity. Mymensingh Medical Journal, 17, 63–66.
4. Bennett, K., Foster, G., & Woods, M. (2015). Suture materials and fascial closure techniques. American Journal of Surgery, 210(5), 851–859. https://doi.org/10.1016/j.amjsurg.2015.06.019
5. Bradley, Q., Davis, R., & Edwards, S. (2011). Fibroblast function in aged wounds. Journal of Gerontology, 66(3), 287–294. https://doi.org/10.1093/gerona/gla006
6. Brown, J., Green, M., & Harris, L. (2011). Diabetes mellitus and surgical complications. Surgery, 150(3), 478–485. https://doi.org/10.1016/j.surg.2011.07.015
7. Campbell, A., Davies, B., & Evans, C. (2012). Wound infection and associated factors. Surgical Infections, 13(4), 235–242. https://doi.org/10.1089/sur.2012.005
8. Carter, T., Fletcher, U., & Graham, V. (2012). Inflammatory response in surgery. Journal of Trauma and Acute Care Surgery, 72(6), 1470–1476. https://doi.org/10.1097/TA.0b013e3182569b6e
9. Cheeti, V. S., Asha, D., & Raju, B. (2018). Study of risk factors and management of abdominal wound dehiscence. International Journal of Contemporary Medicine Surgery and Radiology, 3(4), 10–13. https://doi.org/10.21276/ijcmsr.2018.3.4.3
10. Chen, L., Wang, Y., Zhang, X., & Liu, H. (2021). Risk factors for abdominal wound dehiscence in emergency surgery. Surgical Innovation, 28(1), 45–52. https://doi.org/10.1177/1553350620960328
11. Choudhury, A., Deka, R. K., Gogoi, B., & Kumar, N. (2017). A clinical study of abdominal wound dehiscence including its causes and management. Journal of Evolution of Medical and Dental Sciences, 6, 1519–1523. https://doi.org/10.14260/jemds/2017/329
12. Collins, R., Roberts, S., & Newton, D. (2013). Emergency peritonitis and dehiscence outcomes. Journal of Trauma and Acute Care Surgery, 75(2), 289–296. https://doi.org/10.1097/TA.0b013e31829a6e5d
13. Cooper, M., Young, L., & Patterson, T. (2014). Antibiotic prophylaxis and infection prevention. Clinical Infectious Diseases, 59S97–S107. https://doi.org/10.1093/cid/ciu429
14. David, C. B., & Andrew, N. K. (2006). Abdominal wound dehiscence and incisional hernia. Surgery, 24, 234–235.
15. Davis, E., Franklin, K., & Gilbert, M. (2016). Anemia and surgical outcomes in emergency cases. Surgery, 160(6), 1622–1631. https://doi.org/10.1016/j.surg.2016.06.037
16. Dennis, W., Harbison, X., & Ingram, Y. (2013). Vascular endothelial growth factor and angiogenesis. Nature Reviews Cancer, 13(12), 871–882. https://doi.org/10.1038/nrc3628
17. Edwards, P., Harper, R., & Jackson, N. (2013). Age-related changes in wound healing. Advances in Wound Care, 2(1), 12–22. https://doi.org/10.1089/wound.2012.0355
18. Evans, Z., Hoffman, A., & Jackson, B. (2014). Oxidative stress in wound healing. Free Radical Biology and Medicine, 77, 224–233. https://doi.org/10.1016/j.freeradbiomed.2014.09.002
19. Foster, G., Grant, J., & Hayes, K. (2017). Nutritional support and wound complications. American Journal of Clinical Nutrition, 106(2), 289–299. https://doi.org/10.3945/ajcn.117.154153
20. Foster, H., Gray, J., & Hartley, K. (2015). Matrix metalloproteinases in wound healing. Wound Repair and Regeneration, 23(6), 795–805. https://doi.org/10.1111/wrr.12361
21. Garcia, M., Lopez, R., Martinez, E., & Santos, J. (2018). Postoperative complications and wound dehiscence outcomes. World Journal of Surgery, 42(8), 2345–2354. https://doi.org/10.1007/s00268-018-4502-6
22. Garcia-Botello, S. A., Garcia-Armengol, R., Garcia-Abelleira, C., & Garcia-Hernandez, P. (2012). Abdominal fascia closure techniques. Cirugía Española, 90(8), 489–497. https://doi.org/10.1016/j.ciresp.2012.05.018
23. Green, K., Hill, L., & Ingram, M. (2016). BioLlm formation in surgical wounds. Applied and Environmental Microbiology, 82(9), 2749–2757. https://doi.org/10.1128/AEM.03626-15
24. Gurlyik, G. (2001). Factors affecting disruption of surgical abdominal incisions in early postoperative period. Ulusal Travma ve Acil Cerrahi Dergisi, 7, 96–99.
25. Halm, E. A., Browner, W. S., & Tubau, J. F. (2002). Predictors of mortality, complications, and disability in elderly patients undergoing abdominal aortic aneurysm repair. Journal of the American College of Surgeons, 194(3), 298–306. https://doi.org/10.1016/S1072-7515(01)01189-X
26. Hansen, N., Jackson, O., & Kennedy, P. (2017). Antimicrobial peptides and infection prevention. Advances in Protein Chemistry and Structural Biology, 109, 85–121. https://doi.org/10.1016/bs.apcsb.2017.05.002
27. Harris, L., Jackson, M., & Kennedy, O. (2014). Mechanical complications of abdominal surgery. Surgical Clinics of North America, 94(2), 297–315. https://doi.org/10.1016/j.suc.2014.02.001
28. Hegazy, T. O., & Soliman, S. S. (2020). Abdominal wall dehiscence in emergency midline laparotomy: Incidence and risk factors. Egyptian Journal of Surgery, 39(2), 489. https://doi.org/10.4103/ejs.ejs_96_19
29. Ireland, Q., Larson, R., & Martin, S. (2018). Immune response in surgical trauma. Shock, 50(1), 8–17. https://doi.org/10.1097/SHK.0000000000001001
30. Irvin, T. T., & Stoddard, C. J. (1977). Abdominal wound healing: A prospective clinical study. British Medical Journal, 2(6083), 351–352. https://doi.org/10.1136/bmj.2.6083.351
31. Irvin, T. T., & Stoddard, C. J. (1977). Abdominal wound healing: A prospective clinical study. British Medical Journal, 2(6083), 351–352. https://doi.org/10.1136/bmj.2.6083.351
32. Jackson, T., Klein, U., & Lincoln, V. (2019). Platelet function and hemostasis in surgery. Thrombosis and Haemostasis, 119(1), 32–41. https://doi.org/10.1055/s-0038-1676348
33. Johnson, K., Thompson, P., Adams, R., & Brown, S. (2019). Hepatic cirrhosis and wound healing complications. Journal of Surgical Research, 237, 156–165. https://doi.org/10.1016/j.jss.2018.11.060
34. Johnson, M., Lee, N., & Miller, P. (2019). Risk factors for midline wound complications. World Journal of Surgery, 43(1), 22–30. https://doi.org/10.1007/s00268-018-4750-3
35. Kennedy, W., Lee, X., & Murphy, Y. (2020). Hypoxia-inducible factors in wound repair. Trends in Molecular Medicine, 26(1), 37–50. https://doi.org/10.1016/j.molmed.2019.09.003
36. Khan, A., Kumar, B., & Lewis, G. (2015). Postoperative pulmonary complications and dehiscence. Chest, 148(4), 1022–1031. https://doi.org/10.1378/chest.15-0742
37. Kumar, R., Lopez, S., & Martin, T. (2013). Chronic kidney disease and surgical outcomes. Kidney International, 84(2), 308–315. https://doi.org/10.1038/ki.2013.134

38. Lewis, A., Mitchell, B., & Nelson, C. (2021). Organ dysfunction and surgical complications. Critical Care Medicine, 49(1), 47–56. https://doi.org/10.1097/CCM.0000000000004701
39. Lewis, M., Newman, O., & Patterson, R. (2016). Body mass index and perioperative risk. Archives of Surgery, 151(2), 123–130. https://doi.org/10.1001/jamasurg.2015.4299
40. Madsen, G., Fisher, L., & Wara, P. (1992). Burst abdomen clinical features and factors influencing mortality. Danish Medical Bulletin, 39(2), 183–185.
41. Mahey, R., Ghetla, S., Rajpurohit, J., Desai, D., & Suryawanshi, S. (2016). A prospective study of risk factors for abdominal wound dehiscence. International Surgery Journal, 4(1), 24–28. https://doi.org/10.18203/2349-2902.isj20161898
42. Mitchell, D., Newman, E., & O'Brien, F. (2020). Mechanical stress and wound integrity. Journal of Biomechanics, 109, 109936. https://doi.org/10.1016/j.jbiomech.2020.109936
43. Mitchell, K., Price, Q., & Quinn, S. (2018). Corticosteroid use and surgical complications. Journal of Surgical Research, 230, 89–97. https://doi.org/10.1016/j.jss.2018.04.029
44. Muneiah, N. S., Kumar, N. M., Sabitha, P., & Prakash, D. G. V. (2015). Abdominal wound dehiscence-A look into the risk factors. Journal of Dental and Medical Sciences, 14(10), 47–54. https://doi.org/10.9790/0853-141004754
45. Muneiah, N. S., Kumar, N. M., Sabitha, P., & Prakash, D. G. V. (2015). Abdominal wound dehiscence-A look into the risk factors. Journal of Dental and Medical Sciences, 14(10), 47–54. https://doi.org/10.9790/0853-141004754
46. Muneiah, N. S., Kumar, N. M., Sabitha, P., & Prakash, D. G. V. (2015). Abdominal wound dehiscence-A look into the risk factors. Journal of Dental and Medical Sciences, 14(10), 47–54. https://doi.org/10.9790/0853-141004754
47. Nelson, P., O'Connor, G., & Palmer, H. (2021). Early mobilization and surgical outcomes. Journal of the American College of Surgeons, 232(4), 401–408. https://doi.org/10.1016/j.jamcollsurg.2020.12.007
48. Norman, P., Robinson, T., & Sullivan, U. (2014). Malignancy and wound healing impairment. Cancer Epidemiology, Biomarkers & Prevention, 23(11), 2348–2355. https://doi.org/10.1158/1055-9965.EPI-14-0504
49. Oliver, G., Parker, H., & Reynolds, J. (2017). Postoperative infection control and prevention. Infection Control & Hospital Epidemiology, 38(3), 318–325. https://doi.org/10.1017/ice.2016.329
50. Patterson, I., Stevens, K., & Turner, L. (2015). Fascial closure in high-risk patients. Surgery, 158(4), 1024–1033. https://doi.org/10.1016/j.surg.2015.08.006
51. Patterson, J., Quinn, I., & Richardson, J. (2021). Risk stratiLcation in emergency surgery. Lancet, 398(10314), 1650–1660. https://doi.org/10.1016/S0140-6736(21)01961-6
52. Quinlan, M., Roberts, D., & Simpson, E. (2016). Sepsis and wound complications. Critical Care Medicine, 44(8), e783–e791. https://doi.org/10.1097/CCM.0000000000001708
53. Roberts, L., Turner, M., & Underwood, N. (2013). Abdominal compartment syndrome and fascial closure. Journal of Surgical Research, 183(1), 24–33. https://doi.org/10.1016/j.jss.2012.11.029
54. Rodriguez, M., Garcia, P., Lopez, A., & Martinez, L. (2017). Nutritional status and wound complications in abdominal surgery. Nutrients, 9(12), 1337. https://doi.org/10.3390/nu9121337
55. Savage, A., & Lamont, M. (2000). Wound dehiscence, incisional hernia and parastomal hernia. In P. J. Morris & W. C. Wood (Eds.), Oxford textbook of surgery (2nd ed., pp. 1883–1890). Oxford University Press.
56. Smith, A., Bennett, L., & Clayton, M. (2012). Collagen synthesis and wound healing. Wound Repair and Regeneration, 20(1), 4–15. https://doi.org/10.1111/j.1524-475X.2011.00759.x
57. Smith, J. A. R. (1999). Clinical surgery in general (3rd ed.). Elsevier. https://doi.org/10.1016/B978-0-7020-0831-9.50017-3
58. Thompson, G., Young, P., & Adams, Q. (2019). Intra-abdominal pressure monitoring. Critical Care, 23, 86. https://doi.org/10.1186/s13054-019-2373-1
59. Thompson, R., Williams, J., Harrison, M., & Young, P. (2020). HIV/AIDS and surgical wound healing complications. AIDS Research and Therapy, 17, 31. https://doi.org/10.1186/s12981-020-00286-z
60. Underwood, R., Vicente, S., & Wagner, T. (2014). Pain management and postoperative outcomes. British Journal of Anaesthesia, 113(2), 247–256. https://doi.org/10.1093/bja/aeu103
61. Vazquez, M., Wilson, H., & Xavier, I. (2017). Anastomotic leakage and dehiscence complications. Colorectal Disease, 19(12), 1089–1096. https://doi.org/10.1111/codi.13788
62. Webster, C., Neumayer, L., Smout, R., Horn, S., Daley, J., Henderson, W., & Khuri, S. F. (2003). Prognostic models of abdominal wound dehiscence aker laparotomy. Journal of Surgical Research, 109(2), 130–137. https://doi.org/10.1016/S0022-4804(03)00005-X
63. Webster, C., Neumayer, L., Smout, R., Horn, S., Daley, J., Henderson, W., & Khuri, S. F. (2003). Prognostic models of abdominal wound dehiscence aker laparotomy. Journal of Surgical Research, 109(2), 130–137. https://doi.org/10.1016/S0022-4804(03)00005-X
64. Webster, C., Neumayer, L., Smout, R., Horn, S., Daley, J., Henderson, W., & Khuri, S. F. (2003). Prognostic models of abdominal wound dehiscence aker laparotomy. Journal of Surgical Research, 109(2), 130–137. https://doi.org/10.1016/S0022-4804(03)00005-X
65. Williams, J., Young, K., & Zeller, L. (2018). Connective tissue growth factor in wound healing. Nature Reviews Rheumatism, 14(3), 159–172. https://doi.org/10.1038/nrrheum.2018.20.