

A RETROSPECTIVE ANALYSIS IN TERTIARY HOSPITAL FOR SURGICAL SITE INFECTIONS AFTER EMERGENCY LAPAROTOMY IN ACUTE ABDOMEN PATIENTS

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Abstract

Objectives: to know about percentage of patients getting wound infection and commonly grown bacteria in emergency laparotomy incisions. **Summary:** Surgical site infections are very high in developing countries. Infections at surgical sites leads to delayed discharge from hospital increased cost of treatment to either government or patient themselves. We assessed the infection rate in emergency laparotomy patients and time taken for hospital stay, and treatment done with antibiotics according to culture sensitivity report. **Methods:** This is a retrospective study of patients who had undergone emergency laparotomy for acute abdomen for perforation peritonitis OR intestinal obstruction from Jan 2016 to Dec 2021 in a premier tertiary care hospital in north India. Most of these patients were operated upon by senior residents & assistant professors. We have primarily studied about the wound discharge and culture of bacteria grown from the wound. **Results & discussion:** Total 142 patients underwent emergency surgery for different reasons in 5 years. 70 patients developed surgical site infections either superficial, deep or organ specific involvement in postoperative period during hospital stay. All the patients were operated by midline incision and mass closure done. All the patients of different ages were involved in study and found that majority patients were operated for perforation of intestine or intestinal obstruction and appendicitis. 50% of operated patients developed infections at surgical site of different depth and the culture from these wounds have grown E.coli, klebsiella, Enterobacter and pseudomonas. Wounds were cleaned, drained and dressed and sensitive antibiotics were given for treatment. Majority of patients (40) with infection stayed up to 20 days in hospital whereas 30 patients stayed for more than 30 days in hospital. **Conclusions:** Surgical site infection rate is comparatively very high in patients operated in emergency and for bowel involvement.

Keywords: Infections In Surgical Incisions, Bacteria Grown & Wound Complication.

INTRODUCTION

Acute abdomen is commonest surgical presentation in surgery deptt. The usual cause is perforation peritonitis and intestinal obstruction. These patients were usually operated in emergency as midline Laparotomy. As these patients usually arrive late due to illiteracy and poverty and hence at the time of arrival they are in shock, toxemia and septicemia.

All the patients were operated under General anaesthesia by midline incision & pathology was managed which was usually gut perforation or intestinal obstruction. The peritoneal cavity is

usually soiled with intestinal contents which lead to soiling of abdominal wall and wound. Abdominal wound was closed by mass closure and skin and subcutaneous tissue is sutured by non absorbable silk and dressing done. The first dressing was done 24hrs after surgery and is observed for any collection, discharge which may be purulent, seropurulent or serosanguinous. Pus was sent for culture and sensitivity and commonly grown bacteria was assessed and antibiotics were regulated as per sensitivity. Common bacteria found in culture sensitivity report of these patients of these patients with purulent discharge grows E.coli, pseudomonas, & proteus, etc. These bacterial infections lead to wound dehiscence, delayed wound healing, prolonged hospital stay, weak scar formation and may be burst abdomen or incisional hernias later on. The purpose of this study was to understand the infection rate in emergency laparotomy patients & commonest bacteria causing infection of wounds & plan better management of wounds to prevent further morbidity of patient and leading to complications.

METHODS

This study is a retrospective analysis of all the emergency laparotomies done from Jan 2017 to Dec 2021. The patients were operated for perforation like peptic, ileal, appendicular or colonic & traumatic perforation or haemoperitoneum & intestinal obstruction or pyoperitoneum. The laparotomies were done by senior residents & assistant professors in department who were experienced and qualified surgeons.

All the patients were resuscitated by intra venous fluids and broad spectrum antibiotics started, basic investigations were done for Hb, protein level, renal functions and any systemic comorbidity. All the patients were put on nasogastric tube and foley's catheterization. All the patients were investigated to make a final diagnosis of perforation or intestinal obstruction and were explored by a midline incision. Abdominal contents were examined for free fluid, pus flakes, gangrenous patches of bowel. The severity of contamination was decided on operating table by operating surgeon and accordingly decision was taken according to bowel pathology.

Multiple options were used like primary closure of peptic perforation, whereas for ileal perforation either primary closure or resection anastomosis or ileostomy were planned according to viability of bowel segment involved. But for intestinal obstruction resection anastomosis was done and in few patients stoma diversion was planned.

Abdominal incision was closed as mass closure by non absorbable suture and skin wound cleaned and sutured by silk. In postoperative period wound was examined 24 hrs later for any collection and discharge. Systemic management with antibiotics was done according to culture and sensitivity report & hydration and electrolyte balance was maintained.

The final outcome of all the patients was assessed accordingly. The patients without complications were discharged after suture removal after 8-10 days of surgery and rest with different complications were managed for longer duration in ward

Inclusion Criteria

All the patients who underwent laparotomies due to emergency causes were taken into consideration and included in study.

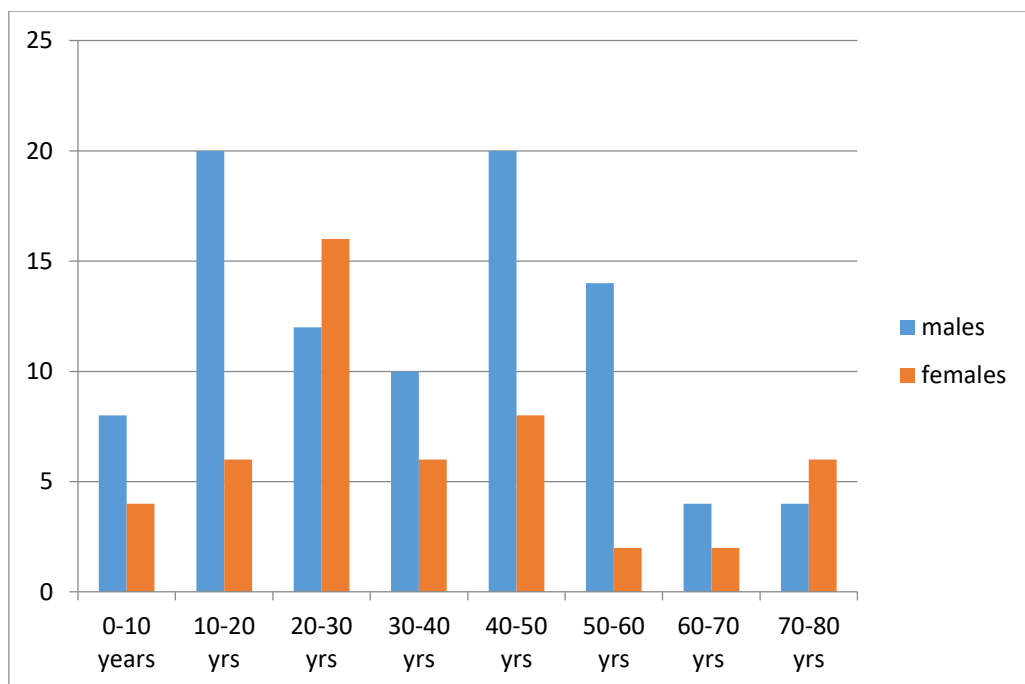
Exclusion Criteria: Elective laparotomies and incomplete records case files were not included.

Data Collection: Case files were retrieved after due clearance from ethical committee for 5 years duration from Jan 2017-dec2021. Details regarding patient demography, preoperative history and diagnosis were collected, surgeries performed and the postoperative course of patient were recorded for proper healing of wounds or infections and discharges from the main surgical wound. Swab samples taken from all infected wounds and organisms isolated in culture sensitivity. CDC classification of SSI was considered for wound infections. Wounds were treated by dressings and systemic antibiotics to sensitivity pattern.

Statistical Analysis:

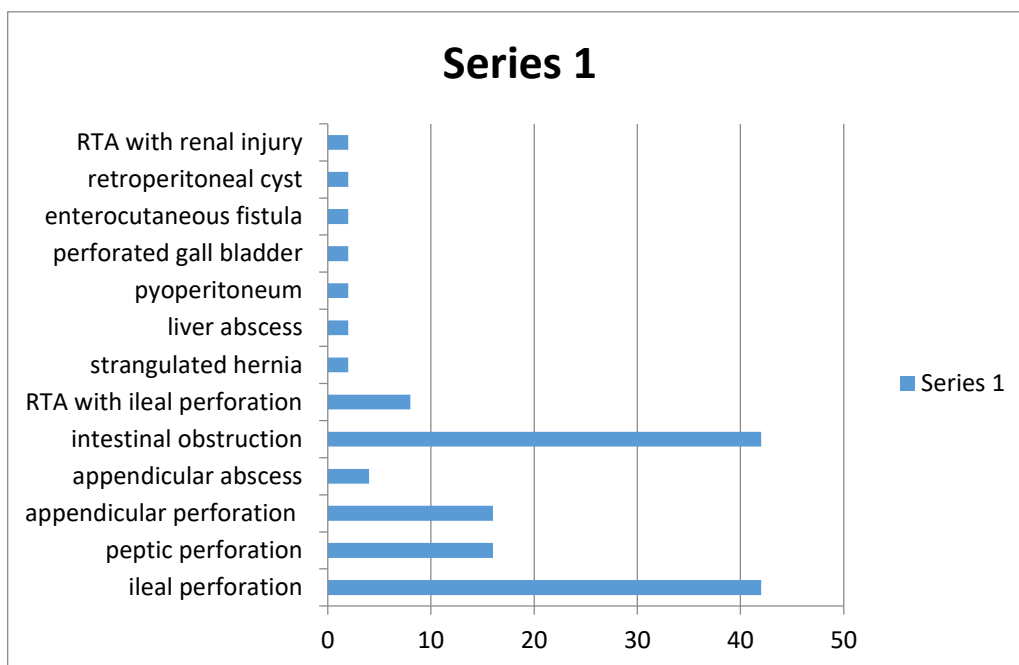
Results

Total 142 patients underwent emergency Laparotomy for different reasons in 5 years duration in tertiary care hospital. 92 were male and 50 were females of different age groups. 70 patients out of 142 developed surgical site infections in postoperative period during hospital stay. Out of these 70 patients who developed SSI, 48 were males and 22 were females.



As all the patients were involved in study up to 80 years age. Majority of patients were reported in 10-60 years of age. Gender wise differentiation is observed in 10-20yrs and 40-50yrs decades with majority of male patients in comparison to females, but 20-30yrs & 70-80yrs decade shows females patients more than male patients.

As these patients were operated for acute abdominal emergencies, the causes of laparotomies are compiled as below.



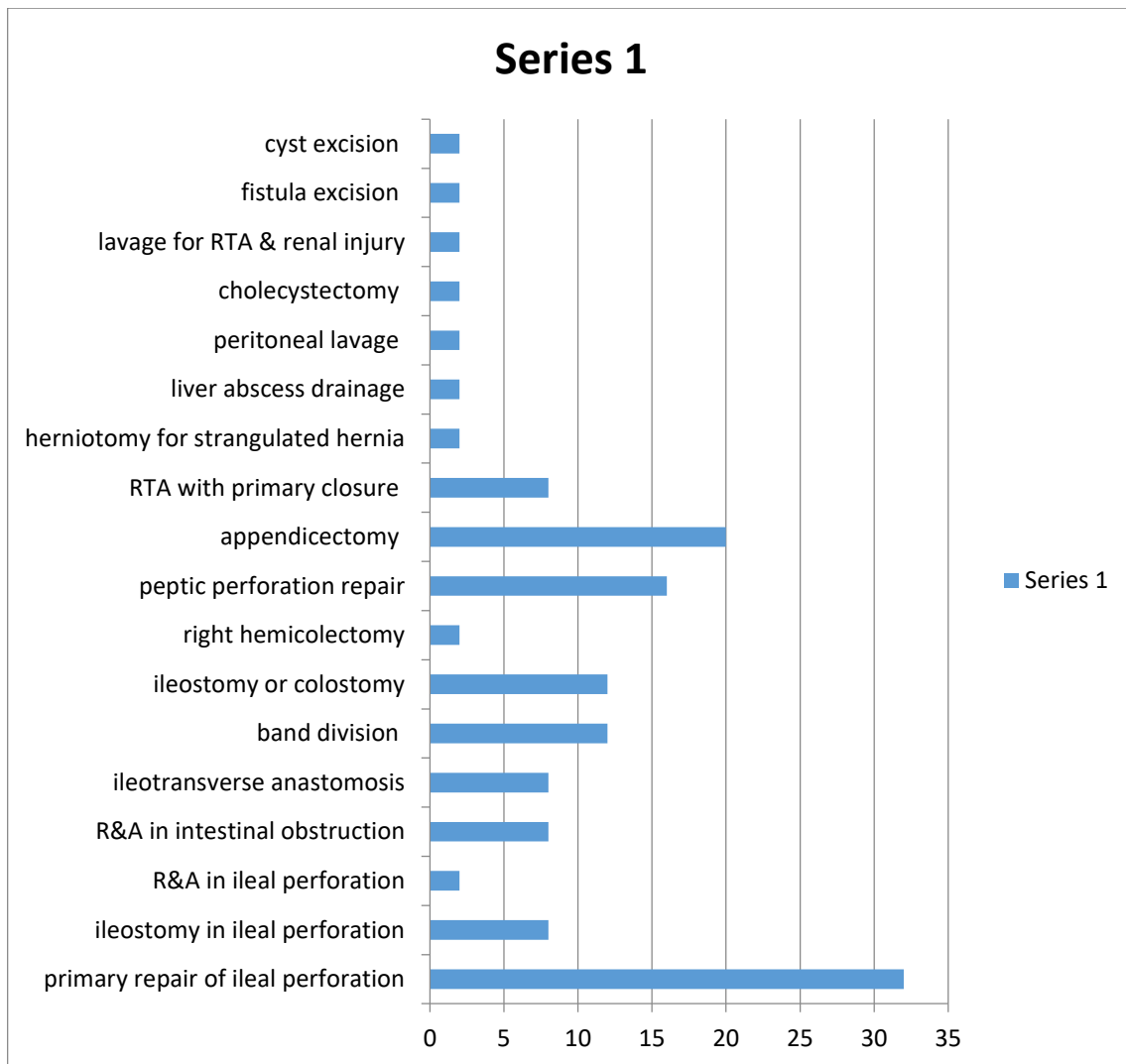
Majority of patients operated were of ileal perforation (42), & intestinal obstruction (42). Other reasons for doing laparotomy were appendicular perforation (16) and appendicular abscess (4), and peptic perforation in (16) patients, (8) patients were operated for RTA with ileal perforation. 2 patients each were operated for strangulated hernia, liver abscess, pyoperitoneum, perforated gall bladder, enterocutaneous fistula, retroperitoneal cyst and RTA with renal injuries.

Different surgeries performed for these emergency laparotomies were compiled as below.

Whatever the reason may be for conducting laparotomy in emergency the decision of surgical procedure was variable according to different diagnosis. As for perforation peritonitis primary repair was done in 32 out of 42 patients. Stoma was made in 8 patients and resection anastomosis done in remaining 2 patients.

But in 42 intestinal obstruction patients, resection anastomosis was done in 8 patients, ileotransverse by pass was done in 8 patients. Band release was done in 12 patients and stoma was made in 12 patients. 2 patients undergone right hemicolectomy.

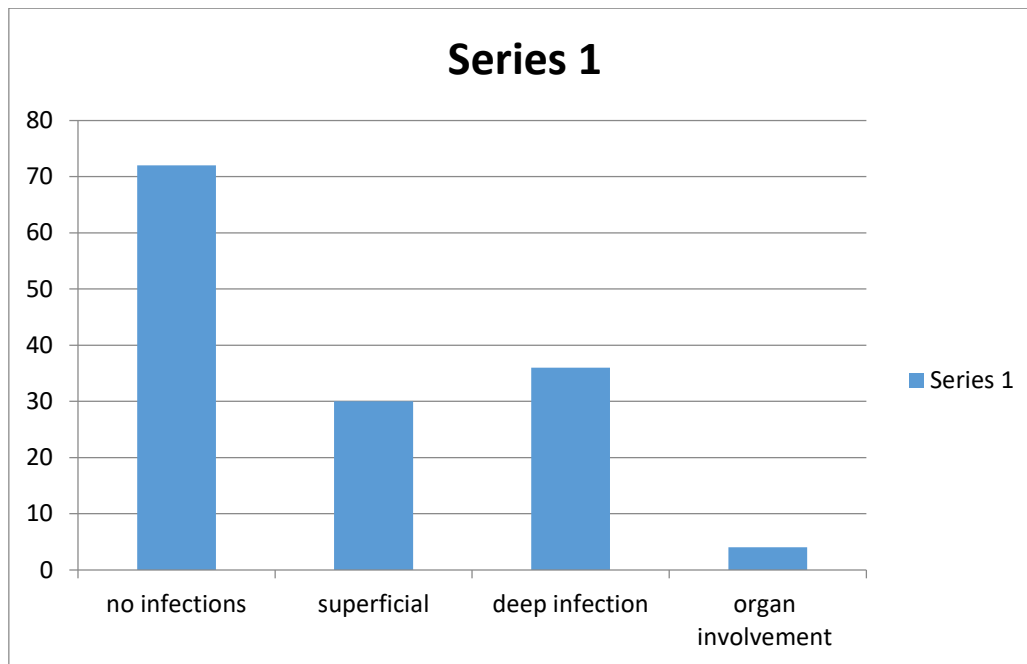
All the 16 peptic perforations were repaired by graham's patch and closed.



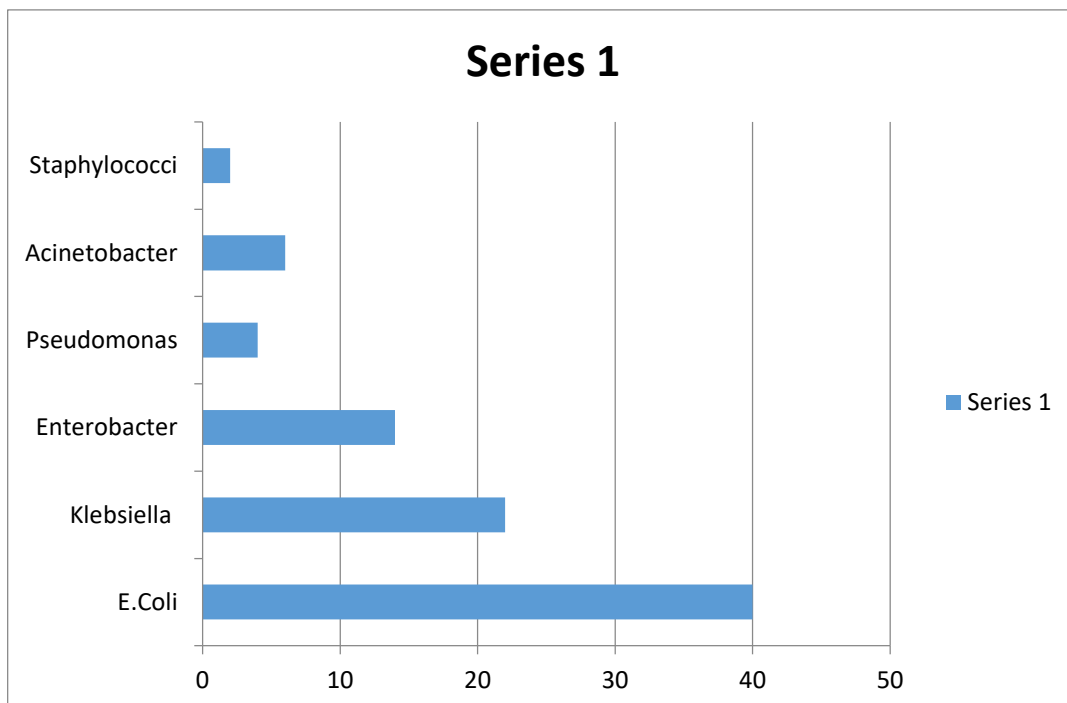
Appendicectomy was done in all perforated appendix patients. Patients with road traffic accident with bowel perforation were managed by primary repair. Rest all patients of liver abscess, gangrenous gall bladder, strangulated hernia and fistula excision were managed according to pathology.

All laparotomy wounds were closed by mass closure (88) or by layered closure (54) using prolene suture.

Almost 50% of patients developed surgical site infection, 36 patients have superficial infection whereas 30 patients developed deep surgical site infection involving rectus sheath and muscle as well and 4 patients developed intraperitoneal organ involvement.



Wound swab was taken and sent for culture & sensitivity. 40 patients had E.coli in culture report, and 22 patients had klebsiella and 14 patients had Enterobacter, whereas 4 patients had pseudomonas, 6 patients grown Acinetobacter and only 2 patients had staphylococci.



DISCUSSIONS

As this study includes emergency laparotomies done for surgical emergencies which usually have contamination of peritoneal cavity; hence the surgical site infection is very high in our study (50%). These patients develop serous, serosanguinous & purulent discharge from surgical incision or organ infection.

The infection rate in our study is very high and this lead to prolonged hospital stay, increased treatment cost and further complications of poor wound healing & increased morbidity. The most important factor may be delayed presentation to the hospital with already developed septicaemia. Other factor may be contamination of abdominal wound during surgery because of unprepared bowel and spillage of bowel contents.

30 patients (45%) out of 70 infected patients were having serous & serosanguinous discharge whereas 18 patients (25%) were having seropurulent and purulent discharge observed. 4 patients developed deep seated abscesses or organ infection.

This rate of infection is almost equal to the study done by Mayank Singh, Latika Agarwal & Rahul Singh, and commonest organism found in infected wound was E.coli.

Another study by Elmonim et al shows SSI rate of 20% in emergency Laparotomy in blunt trauma abdomen and found out preoperative hypotension as one of the cause for SSI and this fact is also proven in our study as well, since majority of patients presented late and were in septicaemia & shock.

The SSI infection rate in our study is very high and E.coli as commonest bacteria cultured from wounds, followed by klebsiella, & Enterobacter.

With culture & sensitivity reports we can formulate the antibiotics policy for institution and in patients prone for SSI, more perioperative precautions can be advised.

Limitations

As this is a retrospective study & all the data collected is from previous records and detail history or operative conditions could not be traced. Sensitivity to drugs were not available in all the records and exact method of wound care was not mentioned properly in all the records. A more extensive prospective study can be done to find out the exact reasons of high SSI in emergency laparotomies and taken preventive measures to decrease the SSI rate and plan antibiotic policy as maximum sensitivity rate & decrease the burden of SSI in laparotomy patients & decrease the morbidity of surgical patients.

Disclosure of Conflict of Interest: None

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