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Intestinal obstruction, a correlation between operative and radiological findings

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***Abstract*---**Aims and objectives: To compare the intra-operative findings in cases of intestinal obstruction to radiological findings and correlate the percentage of cases where the finding matched and where the findings did not match. To help with management of occult cases, in which the intraoperative findings and radiological findings did not correlate. To find occult causes for obstruction, such as hidden malignancies, ischemic pathology for intestinal obstruction. To assess the cause of obstruction using USG, CT and correlate with intra operative findings. Materials and methods: Design of study: This is a hospital based case study in patients attending OPD or admitted in the surgery ward of Krishna Institute of Medical Science, Karad. Study Duration: 18 months December 2019 - June 2021. Sampling size and technique: Study comprises of 50 patients selected with randomised sampling.

***Keywords*---**Intestinal obstruction, radiological, USG.

Material and Methods

Details of research plan:

- Design of study: This is a hospital based case study in patients attending OPD or admitted in the surgery ward of Krishna Institute of Medical Science, Karad
- Study Duration: 18 months December 2019 - June 2021

- Sampling size and technique: Study comprises of 50 patients selected with randomised sampling.

Source of data
Patients admitted in Krishna hospital with the suspicion of intestinal obstruction

Inclusion criteria:
- Patients admitted in Krishna hospital with suspected intestinal obstruction
- Patients with radiological documentation

Exclusion criteria:
- Patients not fit for surgery
- Patients not willing for surgery

Sample size:

N = 4pq/l2
Where, p = the proportion of patients whose radiological findings matched the intra-operative findings (91.84%) q = the proportion of patients whose CT findings did not match the intra-operative findings (08.16%)
l = allowable error (10)
According to data collected from above mentioned study, minimum sample size was found to be 30 with 95% Confidence Interval.
N=50

Statistical analysis

Table no 1
Age and sex distribution

Age

		Frequency	Percent
	30 and below	6	12.0
	31 - 50	10	20.0
	51 - 70	27	54.0
	Above 70	7	14.0
	Total	50	100.0

	N	Minimum	Maximum	Mean	Std. Deviation
age	50	6	90	52.96	17.964

Sex

		Frequency	Percent
	F	23	46.0
	M	27	54.0
	Total	50	100.0

Table no 2
Co-moribidities
Co-morbidities

	Frequency	Percent
Present	36	72.0
Absent	14	28.0
Total	50	100.0

	Absent		Present		Total	
	Count	Row N %	Count	Row N %	Count	Row N %
DM	36	72.0%	14	28.0%	50	100.0%
HTN	38	76.0%	12	24.0%	50	100.0%
Stroke	43	86.0%	7	14.0%	50	100.0%
bronchial asthma	49	98.0%	1	2.0%	50	100.0%
IHD	43	86.0%	7	14.0%	50	100.0%
tuberculosis	47	94.0%	3	6.0%	50	100.0%
renal failure	45	90.0%	5	10.0%	50	100.0%
alcoholic liver disease	48	96.0%	2	4.0%	50	100.0%

Table no 3
Intra-operative findings

	Frequency	Percent
Abdominal tb	1	2.0
Adhesion	16	32.0
Bowel ischemia	4	8.0
Colonic perforation	1	2.0
Hernia	10	20.0
Intussuception	3	6.0
Meckels diverticulum	2	4.0
Neoplasm	3	6.0
Patent urachal tract	1	2.0
Perforated appendix	2	4.0
Perforation	4	8.0
Stricture	1	2.0
Volvulus	2	4.0
Total	50	100.0

Table no 4
Correlation between operative and radiological findings

	Frequency	Percent
Correlated	42	84.0
Did not correlate	8	16.0
Total	50	100.0

Table no 5
Distribution of cases

		Age				sex		Co-morbidities	
		30 and below	31 - 50	51 - 70	Above 70	F	M	Present	Absent
		Count	Count	Count	Count	Count	Count	Count	Count
Diagnosis	Abdominal tb	0	1	0	0	1	0	0	1
	Adhesion	2	4	8	2	5	11	12	4
	Bowel ischemia	0	1	3	0	2	2	3	1
	Colonic perforation	0	0	1	0	0	1	1	0
	Hernia	0	0	6	4	7	3	7	3
	Intussuception	0	0	3	0	2	1	3	0
	Meckels diverticulum	1	0	1	0	1	1	2	0
	Neoplasm	1	1	1	0	2	1	1	2
	Patent urachal tract	1	0	0	0	0	1	0	1
	Perforated appendix	0	1	1	0	0	2	2	0
	Perforation	1	0	2	1	1	3	4	0
	Stricture	0	1	0	0	0	1	1	0
	Volvulus	0	1	1	0	2	0	0	2

Table no 6
Cases which correlated and did not correlate

		Intraoperative findings		
		Correlated Count	Did not correlate Count	Total Count
Diagnosis	Abdominal tb	1	0	1
	Adhesion	15	1	16
	Bowel ischemia	2	2	4
	Colonic perforation	0	1	1
	Hernia	10	0	10
	Intussuception	2	1	3

	Meckels diverticulum	1	1	2
	Neoplasm	3	0	3
	Patent urachal tract	0	1	1
	Perforated appendix	1	1	2
	Perforation	4	0	4
	Stricture	1	0	1
	Volvulus	2	0	2

Cases in which intra-operative and radiological findings did not corelate	
Bowel ischemia	2
Diverticulitis	1
Caecal Ca	1
Adhesions	1
Perforation	1
Urachal tract with umbilical cyst	1
Perforated appendix	1

Data collection procedure

Patients admitted after obtaining informed consent. Patients of suspected intestinal obstruction will be included in study. Those patients not fit for surgery will be excluded from study. A detailed history will be recorded on a specially prepared proforma. A thorough physical examination including abdominal and rectal examination will be done in every patient.

Cardiovascular, respiratory and central nervous system examined for evidence of any concomitant disease. The relevant investigations like complete blood count, blood urea, blood sugar, urine RE and X-ray chest will be performed for preoperative evaluation and fitness for anesthesia.

Operative time, length of postoperative hospital stay, and postoperative complications will be recorded and follow-up in the outpatient clinic by physical examination on a weekly basis for the first six postoperative weeks and then on three monthly basis thereafter, to detect recurrence

Discussion

- Patients who presented with intestinal obstruction to Krishna hospital and were operated for the same, the intraoperative findings were noted and correlated with the radiological findings.
- In 84% of the cases, the intraoperative findings, correlated with the radiological findings, however in 16% of the cases they did not correlate
- Out of the cases that did not correlate, 2 had ischemic bowel in intraoperative finding, where radiology was not able to detect ischemic bowel,resection and anastomosis of ileum was done for the first case of 50 cm, 20 cm away from IC junction, resection and anastomosis was done of jejunum and ileum measuring 40cm for the second case entire small bowel was gangrenous, drain was kept.
- 1 was a transverse colon perforation, for which the radiology report was stated as pancreatitis with peri-pancreatic collection, transverse loop colostomy was done proximal to the site of trasverse loop perforation
- 1 was a case of adhesive band between the previous right paramedian incision and ileum which was reported as a normal sonogram
- 1 was a case of diverticulitis causing twisting of the terminal ileum leading to ischemia, which was reported as dialated ileum with a transition point, with Koch abdomen, for which ileostomy was done proximal to the diverticulum.
- 1 was a case of caecal adenocarcinoma, which was reported as intussuception, for which right hemicolectomy was done
- 1 was a case of adhesive band between the jejunum and the anterior abdominal wall at site of previous appendicectomy scar, paramedian incision, which was reported as a normal study, for which adhesiolysis was done
- 1 was a case of perforated appendix which showed findings of ileal obstruction, for which appendicectomy was done.
- In the 84% of the cases that did correlate, the commonest cause of intestinal obstruction was noted to be Adhesions and bands, followed by neoplasms, followed by ischemic bowel, intusucception,hernias and volvulous
- Hence although radiology is an important tool in the diagnosis of intestinal obstruction, clinical examination and findings should not be ignored
- In another study conducted by Kadhim Jawad Obaid in 2011 where they were noting the pre operative and post operative notes in cases of intestinal obstruction, they found the commonest cause of obstruction to be hernias, followed by adhesion and bands, neoplasms, intusucception and ischemic bowel.
- In another study conducted by the European journal of radiology, they compared the CT findings and intraoperative findings in casese of bowel ischemia and found CT findings concerning mesenteric and bowel wall changes, as well as radiologists' judgement of likelihood of ischemia and necrosis are significantly correlated with perioperative outcome of bowel wall ischemia and necrosis in patients with CL-SBO.
- In another study conducted by Ashwini Kumar Pujhari in 2016, Predicting the conservative or operative management in BO is difficult. Decision on surgery should be taken in paediatric patient by 24 hours, in young age, in virgin abdomen and large BO by 48hrs and within 3-5 days of admission in adults, if the oral gastrografin fails to resolve the BO more so the adhesive obstruction with high (>500mL) gastric tube aspirate (Algorithm). In recurrent

BO some form of plication may be considered during surgery. The early post-operative mortality is strongly linked with the age and the ASA grade whereas the long-term mortality is associated with post-operative complications.

Conclusion

- In 84% of the cases, the intraoperative findings, correlated with the radiological findings, however in 20% of the cases they did not correlate
- Out of the 16% of cases(8 cases) that did not correlate, ischemic bowel, bowel perforation, occult mass in the ascending colon, ischemic bowel were the predominant cases.
- Hence although radiology is an important tool in the diagnosis of intestinal obstruction, clinical examination and findings should not be ignored
- Early surgical intervention should be made in cases where the clinical examination does not correlate to the radiological findings or the radiological findings are inconclusive

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