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A Study on Perioperative Complications Following Radical Cystectomy

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Abstract :
Introduction ***:*** *Radical cystectomy with lymphadenectomy is the gold standard treatment for nonmetastatic, muscle invasive or high risk, nonmuscle invasive Transitional cell carcinoma. Radical cystectomy entails simultaneous surgery on the urinary tract, intestines, and lymph nodes; hence, complications frequently occur after this extensive procedure.*
Materials & methods : A standard surgical procedure was performed in all patients, including meticulous iliopelvic lymphadenectomy with en bloc RC. All complications within 30 days of surgery were graded according to an established 5-grade Clavien Dindo system.
Results : During the study period between May 2015 to April 2017 we analyzed complications following Radical Cystectomy for 30 patients with Bladder cancer. Clavien Dindo grade 0-2 complications occurred in 25 patients (83%) , Grade 3 in 4 patients (13.3%) and grade 5 in 1 patient (3.3%).
Conclusion : Improvements in surgical, anaesthetic technique and increased quality of perioperative care in recent years resulted in reduced morbidity and short hospital stay.

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I. Introduction

Radical cystectomy (RC) is the gold standard treatment for patients with muscle-invasive bladder cancer, and it is also a valid option for selected patients with high grade non muscle invasive bladder cancer, either as a primary treatment modality or for recurrent or refractory tumors after bladder-conserving regimens[1].Radical cystectomy with lymphadenectomy is the gold standard treatment for non metastatic, muscle invasive or high risk, nonmuscle invasive Transitional cell carcinoma[2]. Radical cystectomy provides excellent local cancer control with the lowest pelvic recurrence rates and 50% to 70% 5-year cancer specific survival. RC is one of the most complex urological surgical procedures with reported early complication and perioperative mortality rates of 20% to 57% and 0.3% to5.7%, respectively. Radical cystectomy entails simultaneous surgery on the urinary tract, intestines, and lymph nodes; hence, complications frequently occur after this extensive procedure. According to the literature, the incidence of such complications varies widely from (19% to 64%)[3]. Still, it is essential to consider the whole spectrum of complications, including minor problems as well as perioperative mortality, when planning patient treatment, when evaluating new treatments or surgical techniques, and, most important, when counseling individual patients.

II. Aims And Objectives

1. To evaluate our series of patients who underwent radical cystectomy for muscle invasive bladder cancer for perioperative morbidity and mortality within 30 days.
2. To report the complications according to Clavien-Dindo system.
3. To analyse the complications with respect to different variables like age, sex, transfusion rates, operation time, type of conduit.

III. Material And Methods

Inclusion criteria:
Radical cystectomies performed for urothelial carcinoma in our institute between May 2015 to April 2017 were included in the study.

Exclusion criteria:
1. Patients not willing to participate in the study.

2. Radical cystectomy performed on emergency basis.
3. Patients under went prior radiotherapy.

This study has evaluated all peri operative complications according to the Clavien-Dindo classification system. All procedures were performed in accordance with the ethical standards established at our institution. Indications for RC in our study included tumor invasion of the muscularis propria, high grade invasive bladder tumors associated with or carcinoma in situ refractory to intravesical immunotherapy, or recurrent multifocal nonmuscle invasive disease refractory to transurethral resection and intravesical therapy. Patients who were subjected neoadjuvant, adjuvant chemotherapy and radiotherapy were not included. Clinical stage was based on bimanual examination before and after transurethral resection using anesthesia, histological report of the transurethral resection specimen, chest x-rays and abdominal CT. Third-generation cephalosporins, low molecular weight heparin and elastic compressive stockings were used as prophylaxis for infection and thrombo embolic events in all patients Polyethylene glycol solution was routinely administered the afternoon before surgery for mechanical bowel preparation[6]. All patients who underwent the procedure under combined general and epidural anesthesia with an intrathecal catheter left in place to allow continuous infusion of analgesic drugs during the first few postoperative days. A standard surgical procedure was performed in all patients, including meticulous iliopelvic lymphadenectomy with en bloc RC as described by Skinner and Lieskovsky[4]. For ileal conduit briefly, a 15 to 20 cms portion of terminal ileum long is isolated approximately 10 to 25 cm proximal to the ileocecal valve. Ileal conduits were constructed according to the Bricker or the Wallace technique[5]. Cutaneous ureterostomy was performed for high risk cases. Postoperatively all patients had a nasogastric tube left in place until the first passage of flatus and total parenteral nutrition was given until complete recovery of bowel motility after surgery, usually until postoperative day4 or 5. All complications within 30 days of surgery were graded according to an established 5-grade Clavien Dindo system.

The Clavien-Dindo Classification of Surgical Complications:
Management options according to grading system follows[7.]

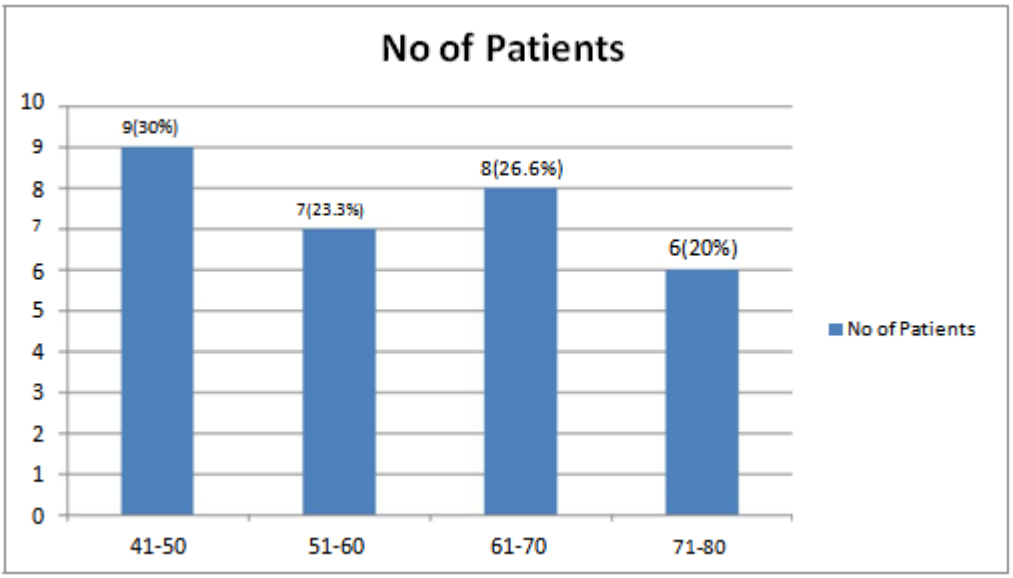
- grade 0—no complications,
- grade 1—complications needing only oral medications or bedside intervention,
- grade 2—complications needing only intravenous medications, total parenteral nutrition, enteral nutrition or blood transfusion,
- grade 3—complication needing interventional radiology, therapeutic endoscopy, intubation, angiography or operation,
- grade 4—complications causing residual and lasting disability requiring major rehabilitation or organ resection,
- grade 5—complications causing death.

IV. Results

During the study period between May 2015 to April 2017 we analyzed complications following Radical Cystectomy for 30 patients with Bladder cancer

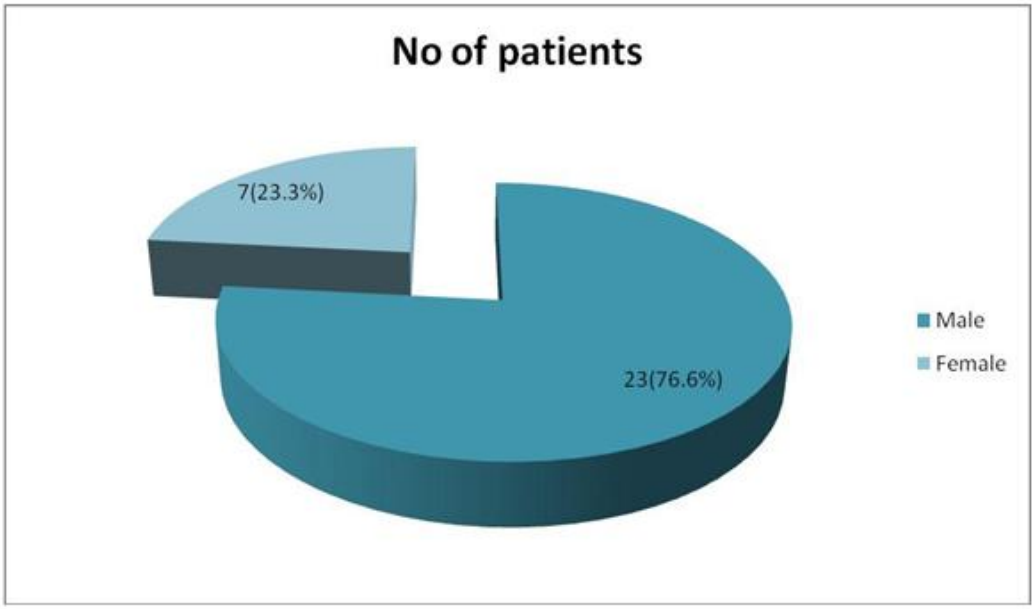
Age:
Out of 30 patients majority of the patients were in the age group between 40-50 years of age.

S No	Age	No of Patients	Percentage (%)
1	41-50	9	30
2	51-60	7	23.3
3	61-70	8	26.6
4	71-80	6	20



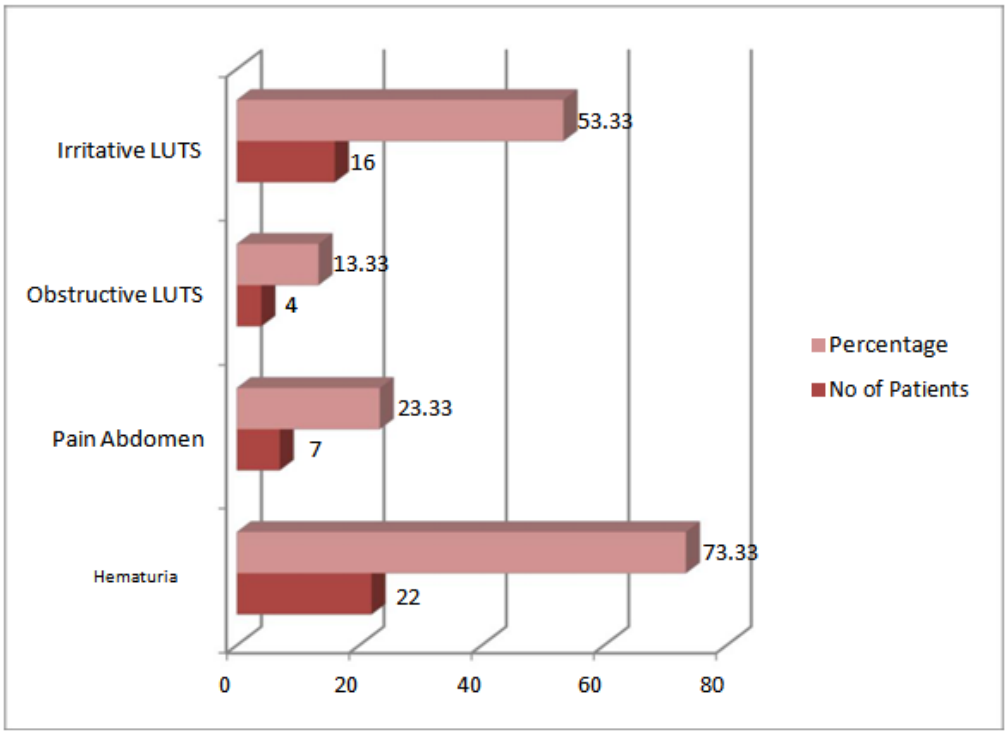
Sex distribution:
Out of 30 patients studied 23 were males and 7 were females with male female ratio of 3.3:1

S No	No of Patients	Percentage (%)
Male	23	76.66
Female	7	23.33



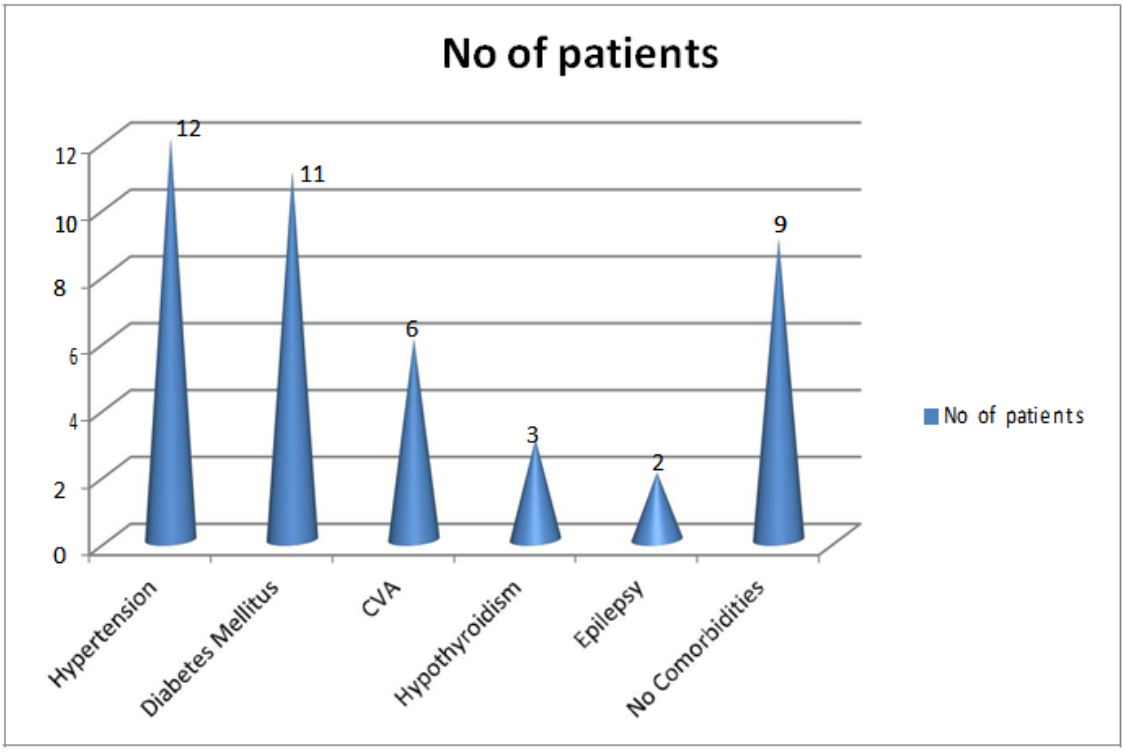
Clinical Presentation:
Majority of patients in our study manifested with Hematuria followed by Irritative LUTS

S No	Clinical symptom	No of Patients	Percentage (%)
1	Hematuria	22	73.33
2	Pain abdomen	7	23.33
3	Obstructive LUTS	4	13.33
4	Irritative LUTS	16	53.33



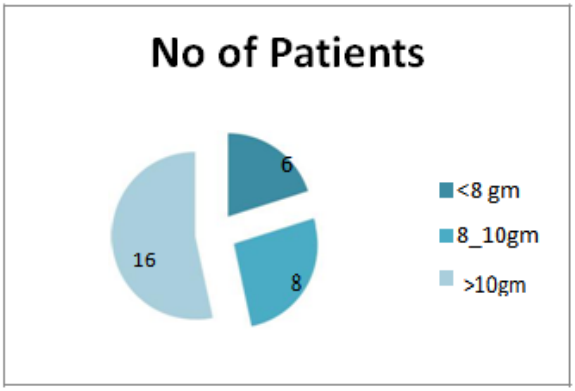
Comorbidities:

S No	Comorbidities	No of Patients	Percentage (%)
1	Hypertension	12	40
2	Diabetes mellitus	11	36.6
3	CVA	6	20
4	Hypothyroidism	3	10
5	Epilepsy	2	6.6
6	No comorbidities	9	30



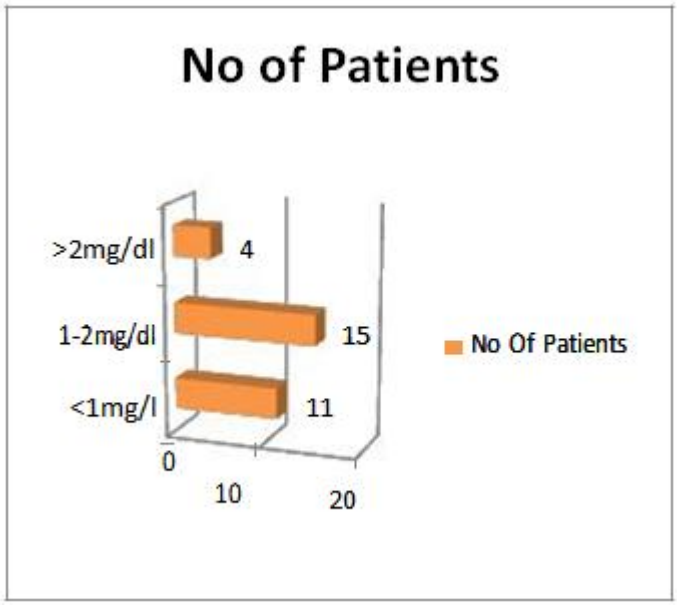
Hemoglobin

S No	Hb%(gm/dl)	No of Patients	Percentage (%)
1	<8	6	20
2	8-10	8	26.6
3	>10	16	53.3



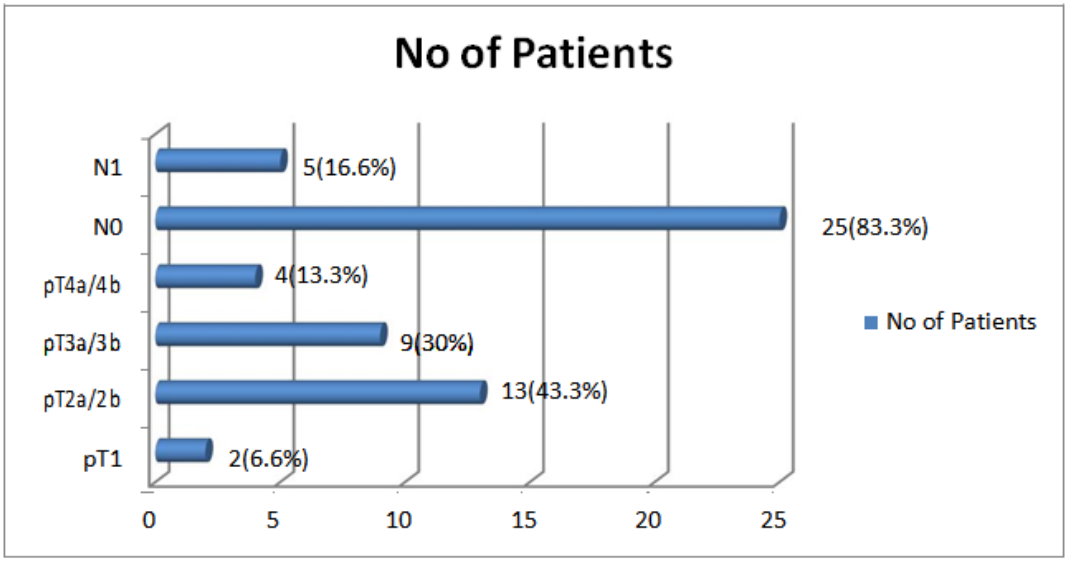
Creatinine

S No	Creatinine	No of Patients	Percentage (%)
1	<1	11	36.6
2	1-2	15	50
3	>2	4	13.3

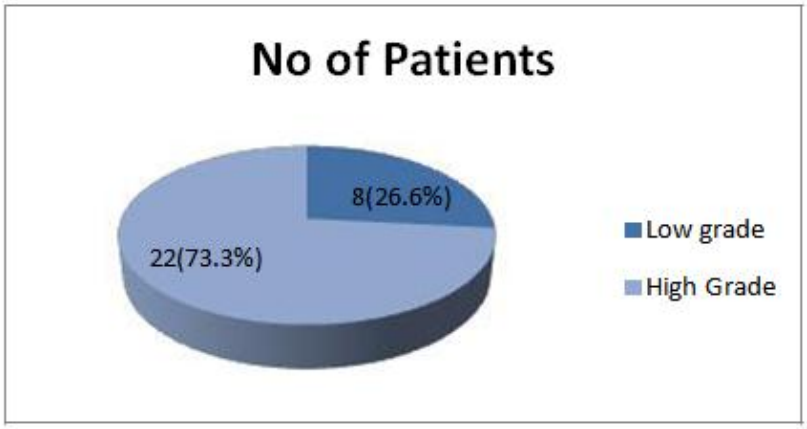


Pathological characteristics:
Tumor stag

S No	Tumor stage	No of Patients	Parentage
1	pT1	2	6.6
2	pT2a/pT2b	13	43.3
3	pT3a/pT3b	9	30
4	pT4	4	13.3
5	N0	25	83.3
6	N1	5	16.6



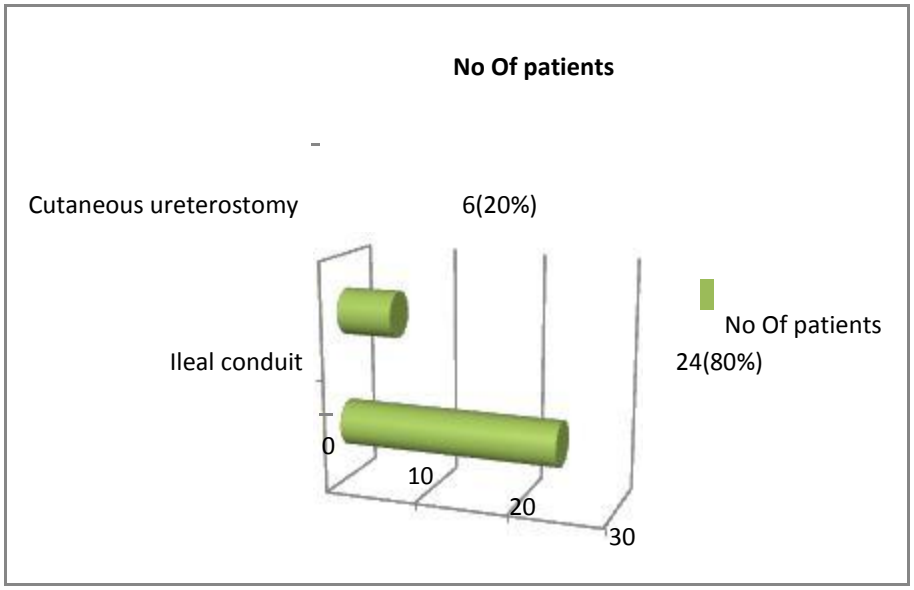
Tumor Grade



Type of urinary Diversion:

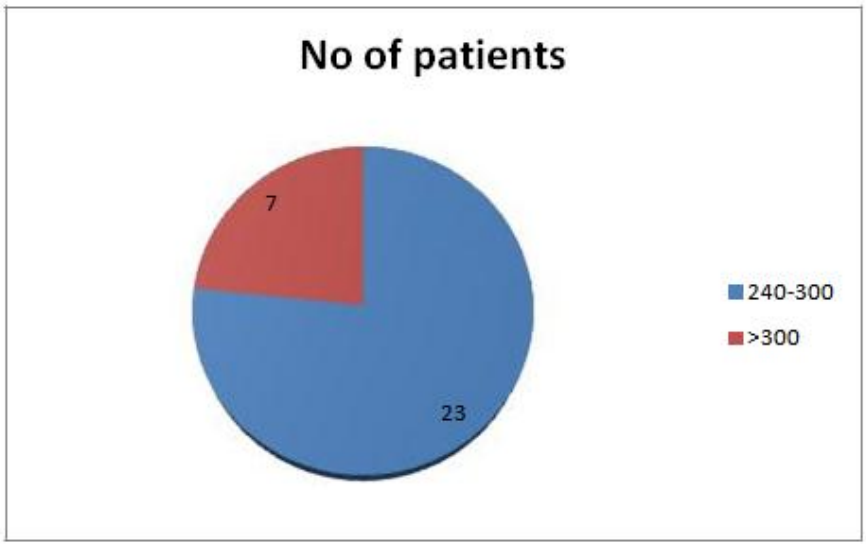
Ileal conduit **24(80%)**

Cutaneous Ureterostomy **6(20%)**



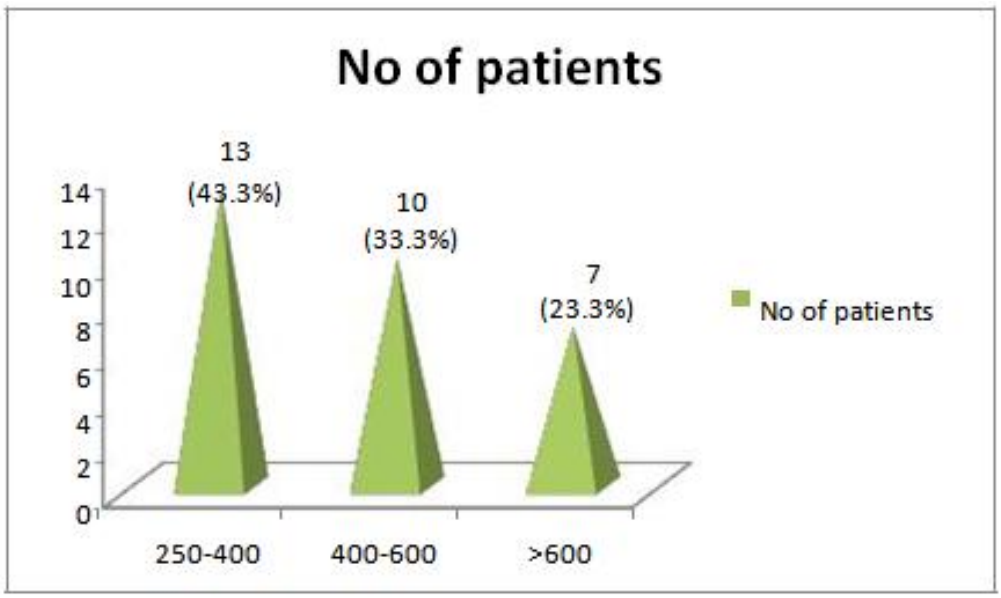
Duration of Surgery

S No	Surgery Duration	No of Patients	Percentage
1	240 – 300 minutes	23	76.6
2	>300 minutes	7	23.3



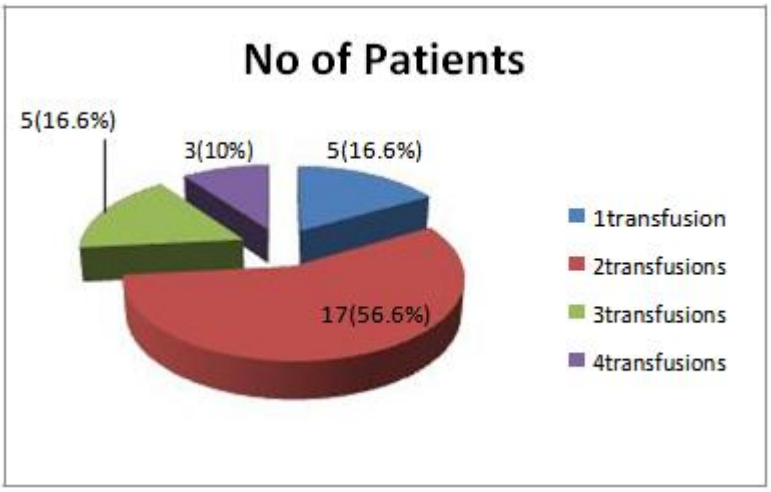
Blood Loss :

S No	Blood loss	No of Patients	Percentage
1	250-400ml	13	43.3
2	400-600ml	10	33.3
3	>600ml	7	23.3



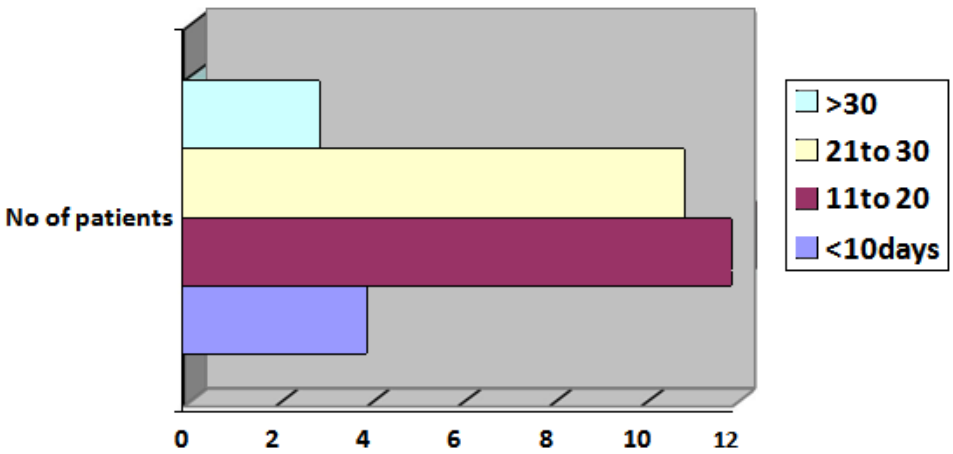
Blood Transfusion

S No	No of transfusions	No of patients	Percentage
1	1	5	16.6
2	2	17	56.6
3	3	5	16.6
4	>4	3	10



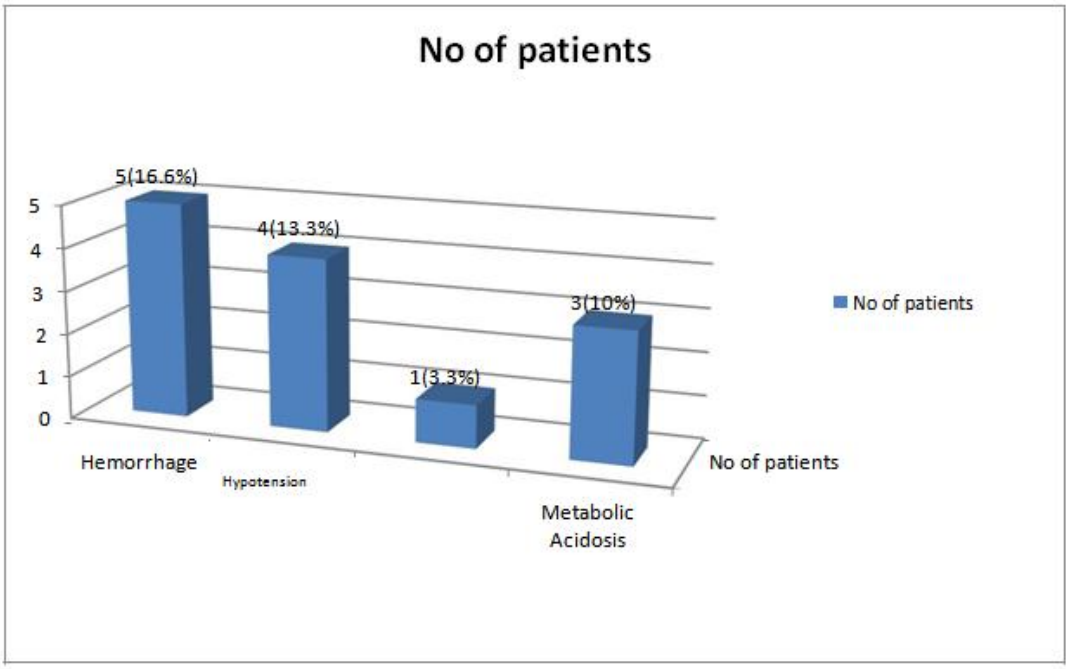
Duration of Hospital stay:

S no	Duration of stay	No of patients
1	<10	4
2	11-20	12
3	21-30	11
4	31-40	3



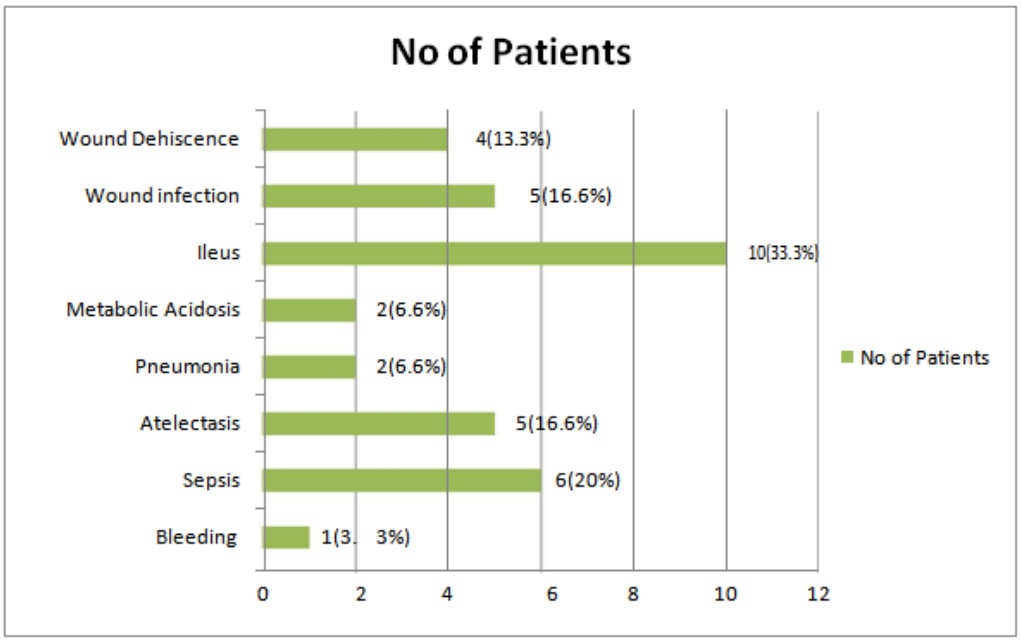
Complications:
Intra operative complications

S No	Complication	No of patients	Percentage
1	Hemorrhage	5	16.6
2	Hypotension	4	13.3
3	Arrhythmia	1	3.3
4	Metabolic Acidosis	3	10



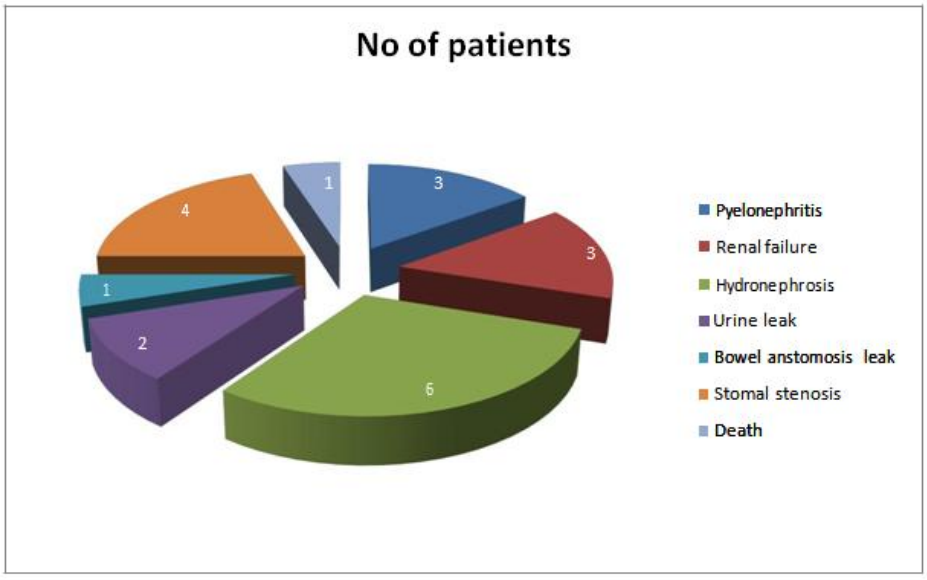
Post operative complications
Immediate post op complications

S No	Complication	No Of Patients	Percentage
1	Bleeding	1	3.3
2	Sepsis(Fever)	6	20
3	Atelectasis	5	16.6
4	Pneumonia	2	6.6
5	Metabolic Acidosis	2	6.6
6	Ileus	10	33.3
7	Wound infection	5	16.6
8	Wound Dehiscence	4	13.3



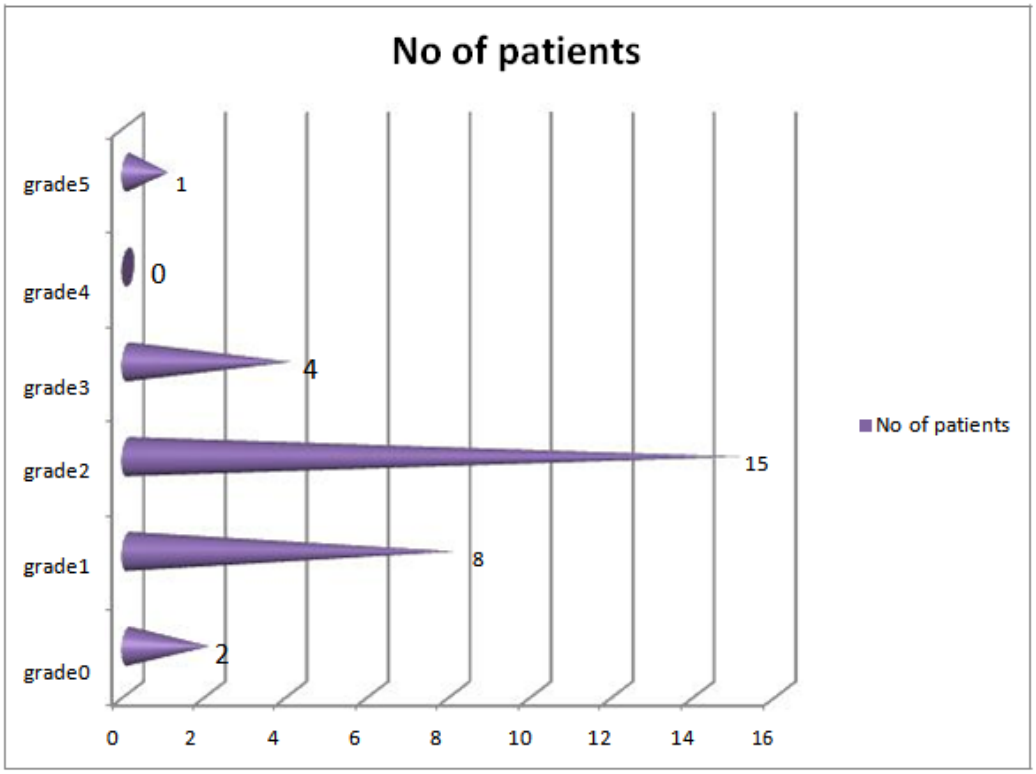
Late post operative Complications:

S No	Complication	No of patients	Percentage
1	Pyelonephritis	2	6.6
2	Renal failure	3	10
3	Hydronephrosis	6	20
4	Urine leak	2	6.6
5	Bowel anstomosis leak	1	3.3
6	Stomal stenosis	4	13.3
7	Death	1	3.3



The Clavien-Dindo Classification of Surgical Complications:

S No	Grade	No of patients	Percentage (%)
1	Grade0	2	6.6%
2	Grade1	8	26.6%
3	Grade2	15	50%
4	Grade3	4	13.3%
5	Grade4	0	0%
6	Grade5	1	3.3%



V. Discussion

Radical cystectomy is the gold standard treatment of choice for patients with invasive bladder cancer and high risk non muscle invasive blader tumours. It is associated with significant morbidity and potentially life-threatening complications. Although the morbidity of radical cystectomy is clearly lower than in previous decades, probably because of more sophisticated postoperative care as well as improved anaesthesiologic and surgical techniques, the rate remains higher than 30% in the early postoperative period. In our series, we observed a 30-day mortality rate of 3.3 %. The reported perioperative mortality rate in cystectomy patients ranges between 0.3% and 4.5%. Ghoneim et al. reported a perioperative mortality of 4% in 1026 cases, and in another large series, Stein et al. Observed 3% perioperative deaths in 1054 patients. The perioperative complication rate of all patients in our series was 56.6% (17 of 30 patients had complications). Stein et al. reported 28%of perioperative complication rate. Shabsaigh and his collegues reported the complications of their Radical cystectomy series from Memorial Sloan- Kettering Cancer Centre, using a Modified Clavien grading system[8]. They reported an overall 30-day morbidity of 58%. Our complication rate closely corresponds to that of Shabsigh et al but small variation due to small sample size in our study. In this series sepsis and prolonged

ileus were the most common complications. We divided complications into medical and surgical complications. Medical complications include-pneumonia, MI, Sepsis, pulmonary embolism, metabolic acidosis, renal failure. Surgical complications includes bleeding, wound infection, wound dehiscence, urinary leak from anastomotic site, small bowel obstruction. In our series complications are graded by using Clavien dindo classification grade1 and 2 are seen in 23 pts, grade 3 and 4 in 4 pts grade 5 seen in1 patient. Mean operative time was 4 to 6.5hrs (median:5.5hrs). And it varies depending up on the type of diversion .The average hospital stay after radical cystectomy in our series ranges between 7 and 35 days. The median postoperative hospital stay in our patients was 16 days and was significantly longer in patients with complications, Compared to younger patients, patients with age>70yrs had more complications. Clavien-Dindo classification of surgical complications Grade 1,2 and 3which were managed conservatively with intravenous fluids and antibiotics or by minimally invasive endourological procedures like DJ Stenting ,Percutaneous nephrostomy for hydronephrosis constituted the major part of complications (>90%),while Grade 4 and 5 complications were(3.3%) less common. Most of the complications were low grade.

VI. Conclusion

Radical cystectomy represents routine surgery in patients who suffer from invasive bladder cancer. Even though cystectomy is a major procedure with a significant complication rate, our results demonstrate that radical cystectomy can be safely performed with acceptable morbidity and mortality in properly selected patients.

It seems that improvements in surgical, anaesthetic technique and increased quality of perioperative care in recent years resulted in reduced morbidity and short hospital stay. We applied a standard methodology to report perioperative complications after Radical cystectomy, about 56.6% had complications within 30 days of surgery. Although most of the complications are minor, about 13.3%patients experienced grade 3 events and 30 day mortality rate is 3.3%(grade 5).

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