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Clinical Study On Assessment Of Post Surgical Complications According To Clavien Dindo Classification In Open And Laparoscopic Elective Abdominal Surgeries.

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ABSTRACT

The absence of consensus within the surgical community on the best way to report surgical complications has hampered proper evaluation of the surgeon's work and possibly progress in the surgical field. Hence, Clavien Dindo classification of complications has subsequently been used by us for outcome assessment. The aim of this study was to assess the Clavien-Dindo classification among the patients who underwent major elective abdominal surgeries including open and laparoscopic abdominal procedures. All abdomen cases admitted to surgical ward for major surgery will be evaluated through history, co-morbid condition and thorough clinical examination on the basis of inclusion and exclusion criteria. Routine investigation will be done and specific investigation like x-ray. USG and CT scan will do depending upon the provisional diagnosis and their requirement. and parameters like operative procedure, length of post-operative period, post operative complication and management recorded and then postsurgical complication classified based on Clavien-Dindo classification and assessed. This prospective study involving 214 patients admitted for abdominal pathology who underwent either open or laparoscopic major abdominal procedures included different age group of patients with different co morbid conditions. Post operative complications were studied in each of these patients and graded according to Clavien-Dindo classification. In this classification, grades I and II include only a minor deviation from the normal postoperative course which can be treated with drugs, blood transfusions, physiotherapy and nutrition, while grades III and IV require surgical, endoscopic or radiologic intervention, and intermediate care or ICU management. This study demonstrates that Clavien-Dindo classification is a effective and a useful tool for reporting complications following abdominal surgeries in a simple way. Any deviation from the normal course following a surgery can be easily distinguished by this classification. it also clearly differentiates the complication severities from one another.

Keywords: Clavein-Dindo, Postoperative Course, ICU Management.

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INTRODUCTION

In this era of contemporary scientific evidence-based world, the patient, the insurer, and the insurance company all head towards quality health care at cheaper cost in spite of rising inflations. The frustrating aspect of the operative care of patients is the development of post operative complications [1]. Any surgeon regardless of his experience and skills can encounter post operative complications which should be weighed and compared with others for better outcomes in future. Such complications have multi-faceted problems like lost work productivity, disruption of family life and stress to employers, to society and to the insurance company [2]. In some cases the pre operative level of function of the person can't be regained back [3]. Thus, a patient who enters the hospital with stress & anxiety about undergoing an uneventful surgery has to leave the hospital with increased anxiety due to disability arising out of surgical complications [4]. Also, there are evidences of variations in clinical practice which triggered interests in measuring and improving the quality of health care delivery. For a valid and valuable assessment of the relevant data on the outcomes in a post operative care has to be standardized. This stratification is obtained by scoring systems in the post operative care [5]. The scoring system for the stratification has to be universal by which the comparison among different centers, different procedures and within a center over the time has to be valid and applicable at any post operative period. This helps the patients, health care providers and the insurers to trust the quality of health care [6]. To improve the quality of care and to minimize the complications, a system of standard classification is needed to properly assess the complications. Clavein-Dindo classification is one such classification of post operative complications [7]. This study employs this classification on the post operative patient and was analyzed between open and laparoscopic abdominal surgeries.

MATERIAL AND METHODS

This prospective study was conducted at madras medical college in the year 2015-2017.All abdomen cases admitted to surgical ward for major surgery will be evaluated through history, co-morbid condition and thorough clinical examination on the basis of inclusion and exclusion criteria. Routine investigation will be done and specific investigation like x-ray. USG and CT scan will do depending upon the provisional diagnosis and their requirement. and parameters like operative procedure, length of post-operative period, post operative complication and management recorded and then postsurgical complication classified based on clavien-dindo classification and assessed.

RESULTS

In this study, the cohort of patients with abdominal pathology were identified (n=595).Of this, 376 patients underwent emergency abdominal surgery, 7 patients had history of previous surgery were excluded from this study.214 patients satisfying inclusion criteria were selected for the study. All the patients gave consent for participating in the study. Of this 214 patients, 108 patients were male, 106 patients were female .Of this 214 patients 97 patients were subjected to elective abdominal open surgical procedures and 117 patients underwent elective laparoscopic abdominal surgical procedures which is shown in Figure 15. Number of male patients subjected for open versus laparoscopic elective abdominal procedures were found to be equal (n=55 vs. n=53) but in the female patients' laparoscopic elective abdominal procedures are done in higher number compared to open procedures (open vs. lap; n=44vs. n=62) as seen. In this study population , there were only 2 patients who belonged to the age group <20 years. Majority of the patients were in the age group of 31 to 60 years. There were 42 patients in the age group of 31 to 40 years,48 patients in the age group of 41 to 50 years, 62 patients in the age group of 51 to 60 years. There were 41 patients in the age group more than 60 years

Chart 1: It can be analyzed from our bar chart that among the total 214 patients, 117 patients underwent laparoscopy procedure contributing to 54% where only 46% of our patients that is 97 patients underwent open surgeries.

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Chart 1: Case Distribution In Open Vs Laparoscopic Surgical Procedures

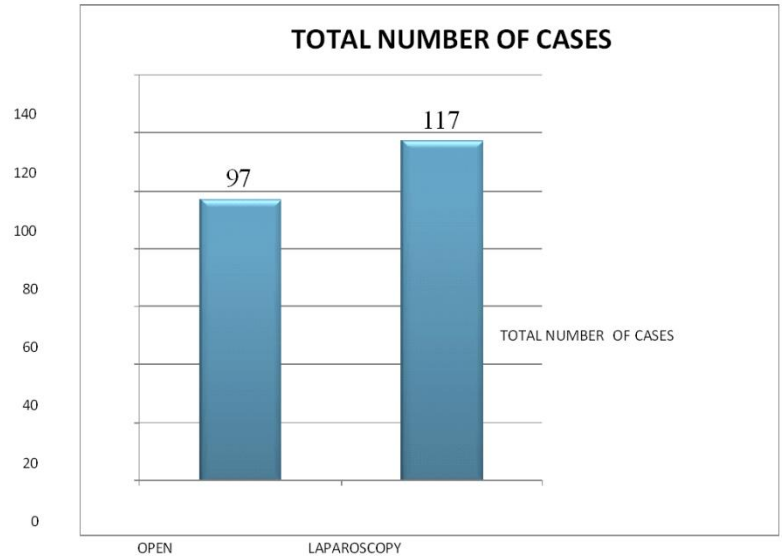

Chart 2: Comparison Of Sex Distribution In Open Vs. Laparoscopic Procedures

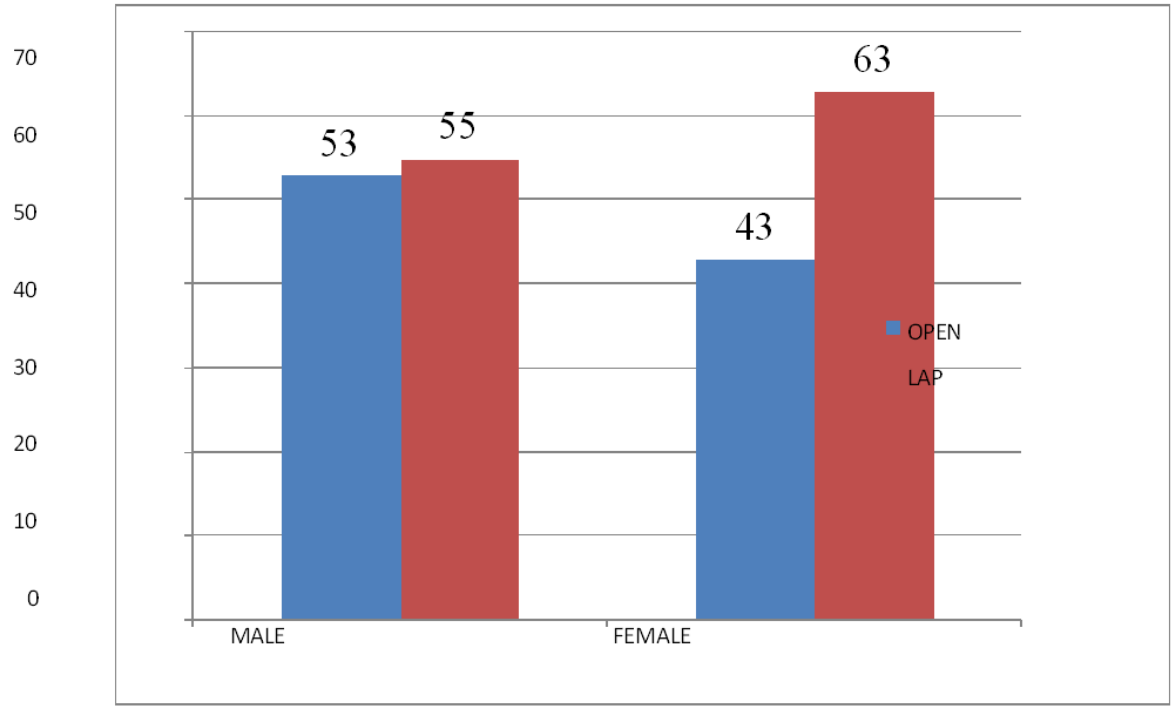

Chart 2: Following findings are observed from the bar chart. among the total 108 male patients, 55 underwent laparoscopic surgeries and 53 underwent open surgeries. this shows almost an equal ratio. but a significant difference can be seen in female set of patients. of the total 106 patients, 43 underwent open surgeries and 63 underwent laparoscopic surgeries. almost 60% of the female patients underwent laparoscopy surgery and only 40% had open surgeries.

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Chart 3: Number Of Cholecystectomy Procedures - Open Vs Laparoscopicmethod

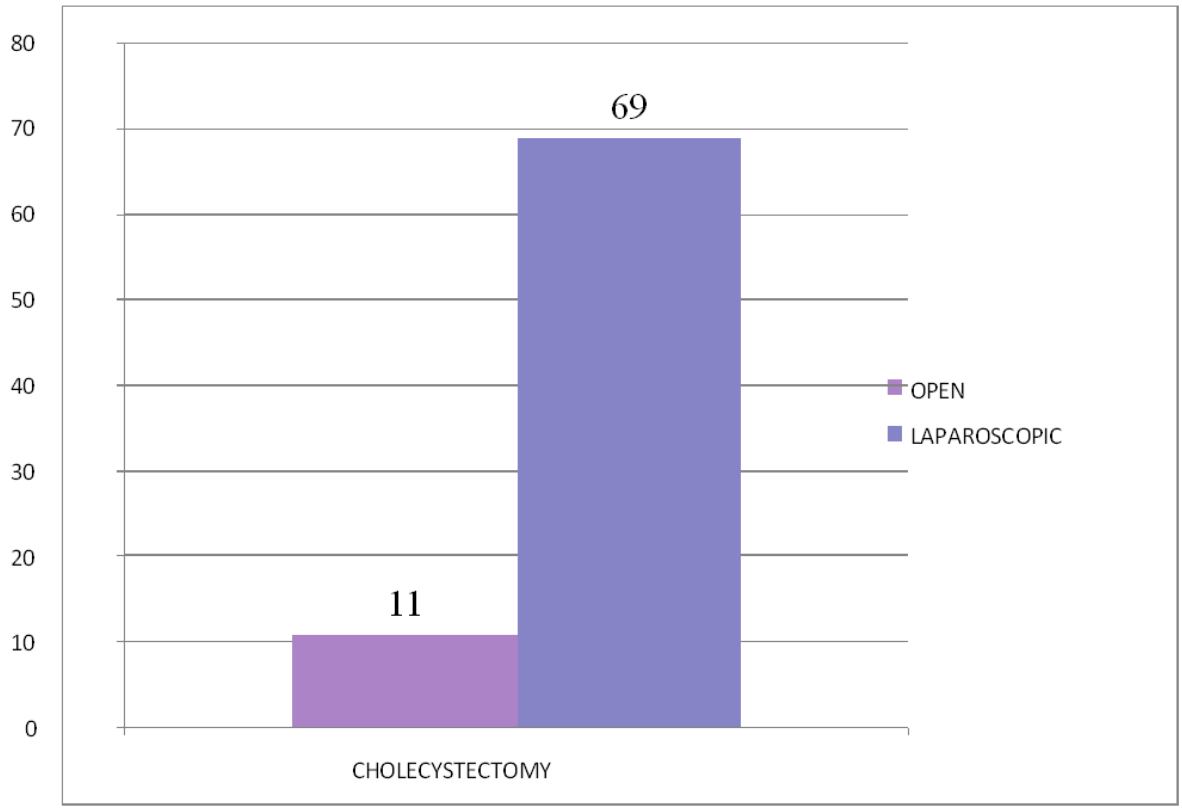

Chart 3: Among the commonly done major laparoscopic surgeries, laparoscopic cholecystectomy was the most commonly performed surgeries. among the 80 patients who underwent cholecystectomy, 69 patients i.e. 85% of patients underwent laparoscopic cholecystectomy and only 11 patients i.e. 15% had undergone open cholecystectomy.

Chart 4: Number Ventral Hernia Repair - Open Vs Laparoscopic Method

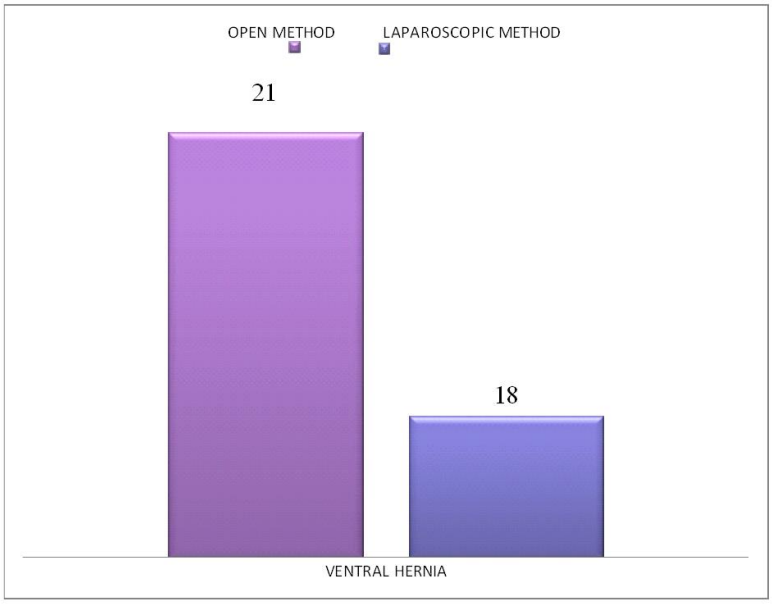

Chart 5: In contrast to cholecystetomies, majority of the ventral hernia repair performed was by open method. among the 39 patients who underwent surgery for ventral hernia, 21 patients were operated by laparoscopic repair and only 18 patients were operated by the technique of open mesh

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repair.

Chart 5: Cases Done Exclusively By Open Procedure

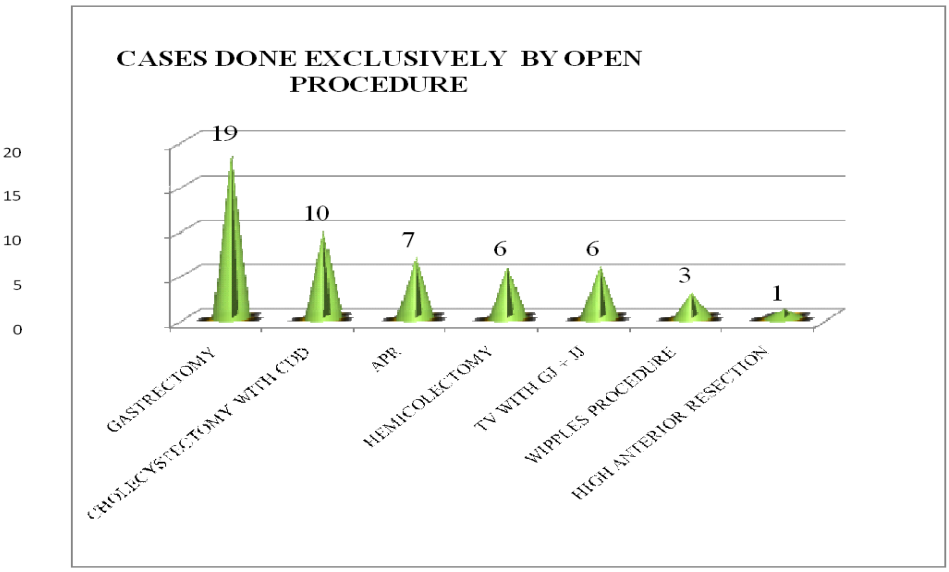
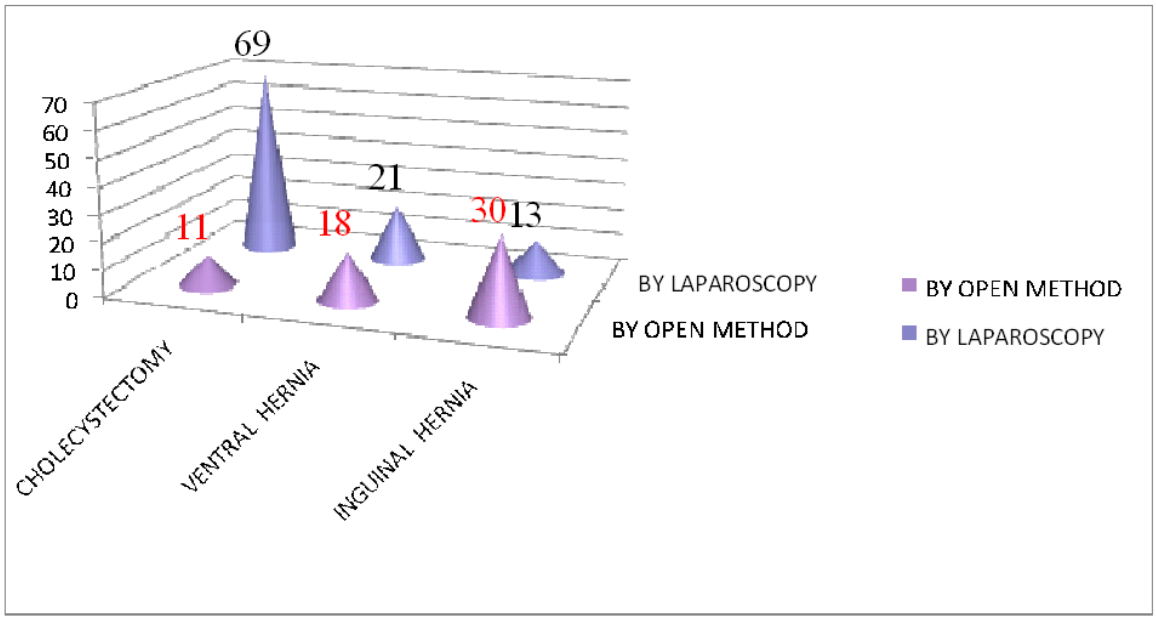


Chart 5: There were no surgeries which were exclusively done by laparoscopic method. Most of the oncological procedures were done by open technique in view of lymph nodal clearance .The major oncological procedures done were 1. Gastrectomies 2. Colectomies 3.Pancreatic procedures.Few surgeries which were done by both open technique and laparoscopic technique were:Totally 80 Cholecystectomies were done, 69 cases were done by Laparoscopic technique and 11 cases by open technique. of the 39 ventral hernia repair, 18 cases had Laparoscopic surgery and 21 cases open surgery. 43 inguinal hernia repair was done. Of which 30 cases underwent laparoscopic method and 13 cases underwent Open method. In Open Inguinal hernia , only Scrotal Abdomen cases were done .

Chart 6: Open Vs Laparoscopic Surgery Technique



In this study population (n=214) , 153 patients had no co morbidity, 79 patients had co morbidity conditions like Diabetes Mellitus, Systemic Hypertension, Coronary Artery Disease, Chronic Kidney Disease.

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Chart 7: Co Morbidity Pattern In Patients Underwent Open & Laparoscopic Methods

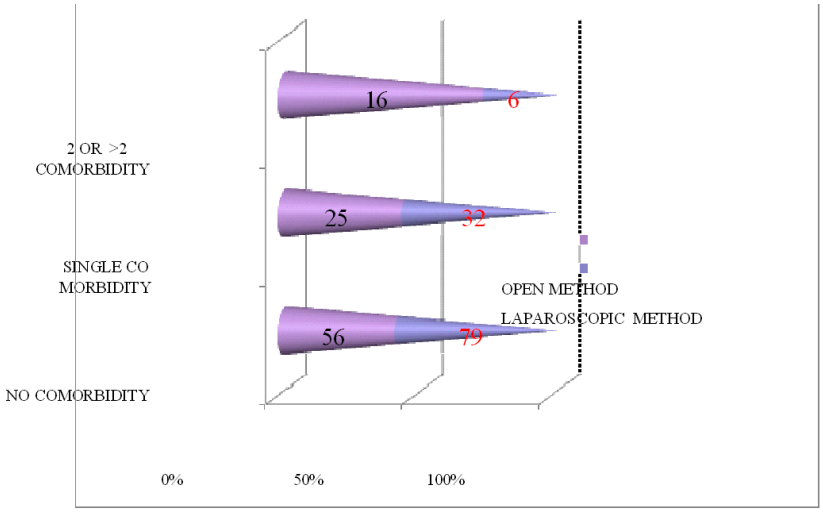
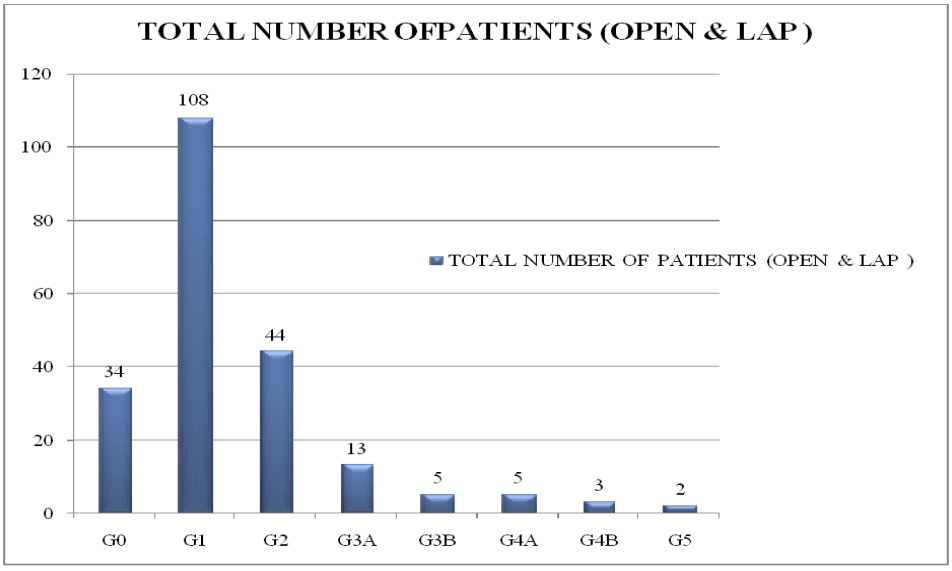


Chart 7: Total of 135 patients had no co morbidity of which 56 patients were subjected for Elective abdominal open surgical procedures, 79 patients were subjected for Elective abdominal laparoscopic surgical procedures. Out of 57 patients with single co morbidity 25 patients underwent open procedures 32 patients underwent laparoscopic procedures. Total of 22 patients with 2 or more than 2 co morbidity 16 patients subjected for open, 6 patients subjected for laparoscopic procedures.

Chart 8: Total Number Patients In Various Grades Of Complications



In this study population (n=214), 34 patients (15.8%) had no complication, 180 patients were developed complications during their post operative period among which 108 patients (50.46%) developed Grade 1 complications, 44 patients (20.5%) developed Grade 2 complications, 13 patients (6.07%) developed Grade 3A complications, 5 patients (2.3%) developed Grade 3B complications, 5 patients (2.3%) developed Grade 4A complications, 3 patients developed (1.4%) Grade 4B complications, 2 patients (0.9%) developed Grade 5 complications.

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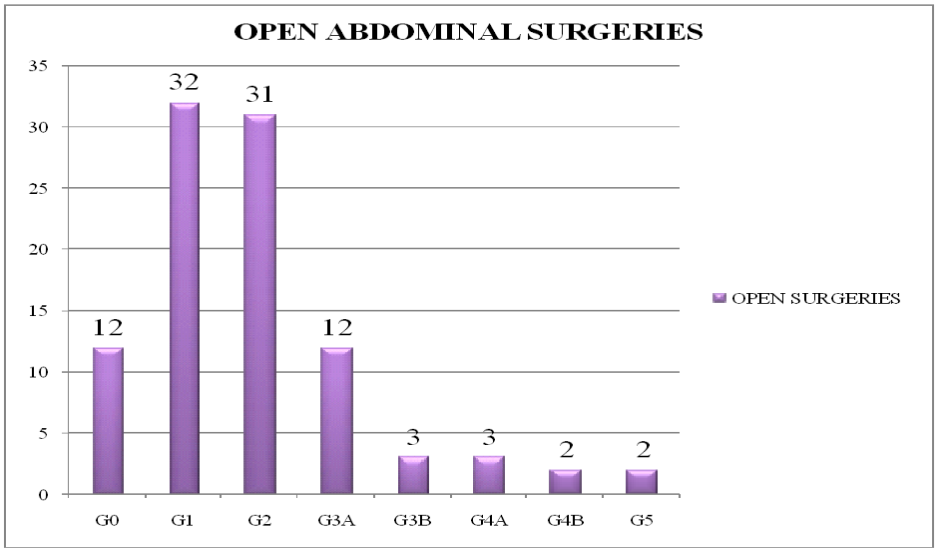
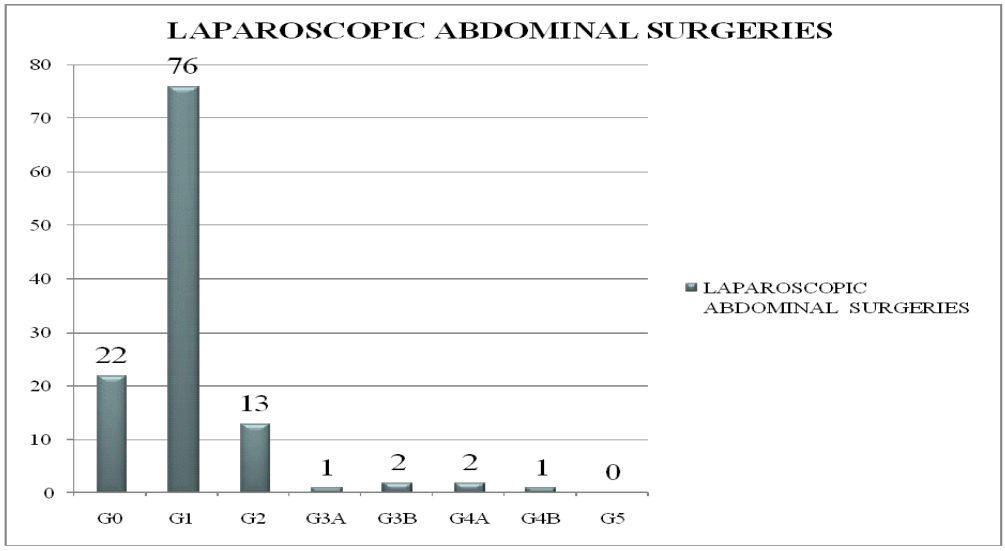
Chart 9: Open Surgery Complications - Number Of Patients In Various Grades



In this study (n=214) about 97 patients underwent varies types of major elective open abdominal surgeries, Of which 12 patients post operative period was uneventful means they does not had any complications, 32 patients were developed Grade 1complications, 31 patients were developed Grade 2 complications, 12 patients developed Grade 3A complications, 3 patients developed Grade 3B complications, 3 patients developed Grade 4A complications, 2 patients developed Grade 4B complications, again 2 patients developed Grade 5 complications.

Chart 10: Laparoscopic Surgery Complications - Number Of Patients In Various Grades



In this study population (n=214), 117 patients underwent elective laparoscopic abdominal surgeries. 22 patients did not develop any complications. According to Clavien Dindo Classification system of complications, 76 patients came under Grade 1,13 patients under Grade 2, only1 patient under Grade 3A,2 patients under Grade 3B, 2 patients under Grade 4A and 1 patient under Grade 4B. No mortality was recorded in laparoscopic group(Grade 5 = 0).

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Chart 11: Open Vs Laparoscopic Surgery Complications - Number Of Patients In Various Grades

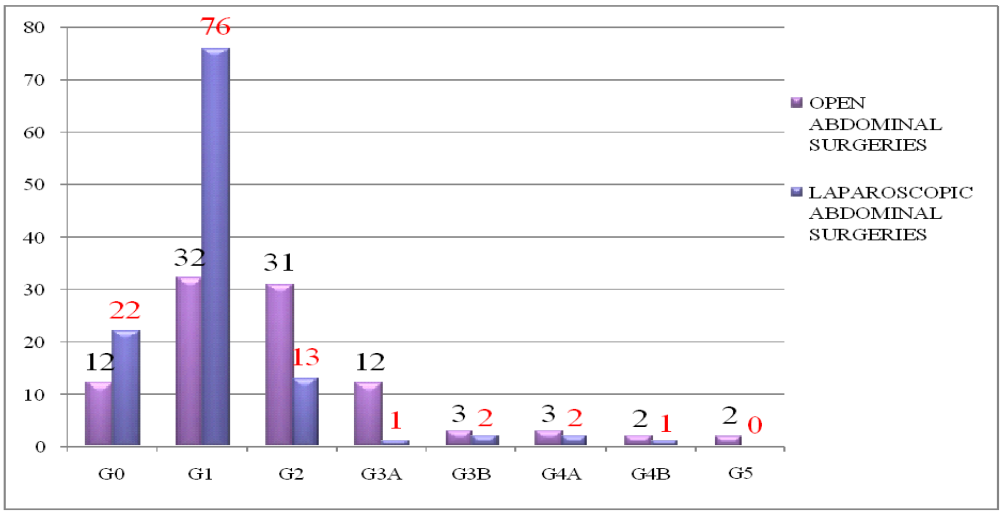

Chart 11: In this study, while comparing complication grades in both open and laparoscopic elective major abdominal surgeries, laparoscopic group (n=18.80%) did not develop any complications when compared with the open group (n=12.37%). according to Clavien-dindo classification, low grade complications includes G0, G1,G2, and G3A. In this study, majority of patients operated by laparoscopy and open method developed only low grade complications while only very few patients developed high grade complications which is comparatively more in open surgery group (open, n=77%; lap, n=76.92%). No mortality was recorded in Laparoscopic group. 2 patients (1.94%) expired in open group.

Chart 12: Grading Of Complications In No Co Morbid Group

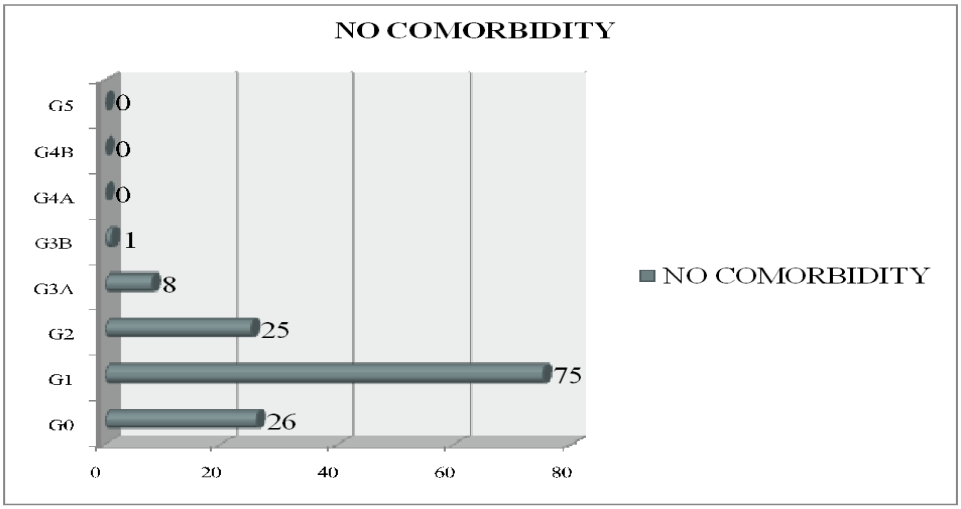

Chart 12: When observing the co morbidity with complications(n=214), 135 patients had no co morbidity. out of this 135 patients about 26 patient did not develop any complication, 75 patients developed G1 complications,25 patients developed Grade 2 complications, 8 patients developed Grade 3A complications, 1 patient developed Grade 3B complication and nobody developed Grade 4 & 5 complication.Among the patients with no co morbidity, majority of the complications developed were in G1 group. 51 patients who underwent laparoscopic surgeries and 24 patients who underwent open surgeries with no co-morbidities developed G1 complications. there were no patients in the high complication group.

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Chart 13: Grading Of Complication In Gastrectomy Surgery

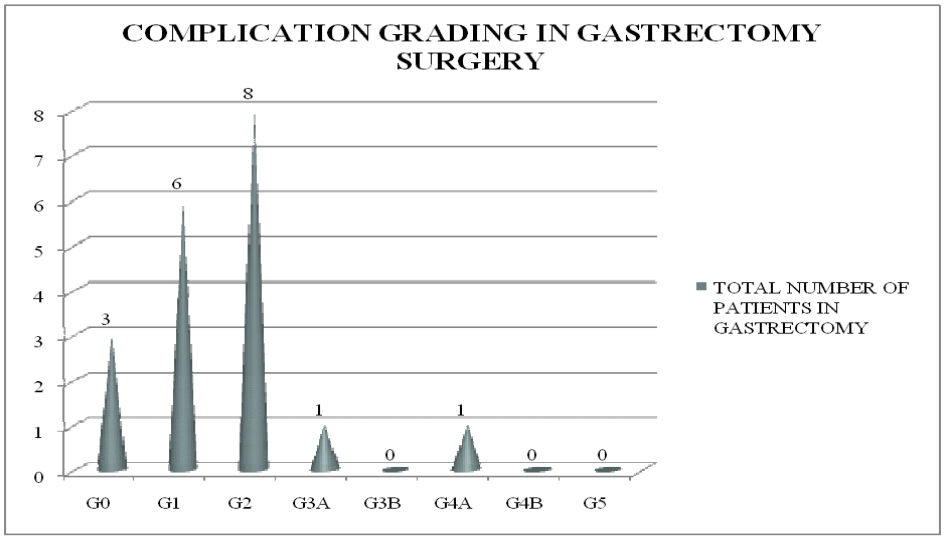

Chart 13: The above chart shows the various number of patients developing different complications undergoing gastrectomy surgeries. majority of the patients developed only low grade complications. 3 patients developed in G0, 6 patients developed in G1 and 8patients developed G3 complications.

Chart 14: Complication Grading In Cholecystectomy With Choledocho deuodenostomy Surgery

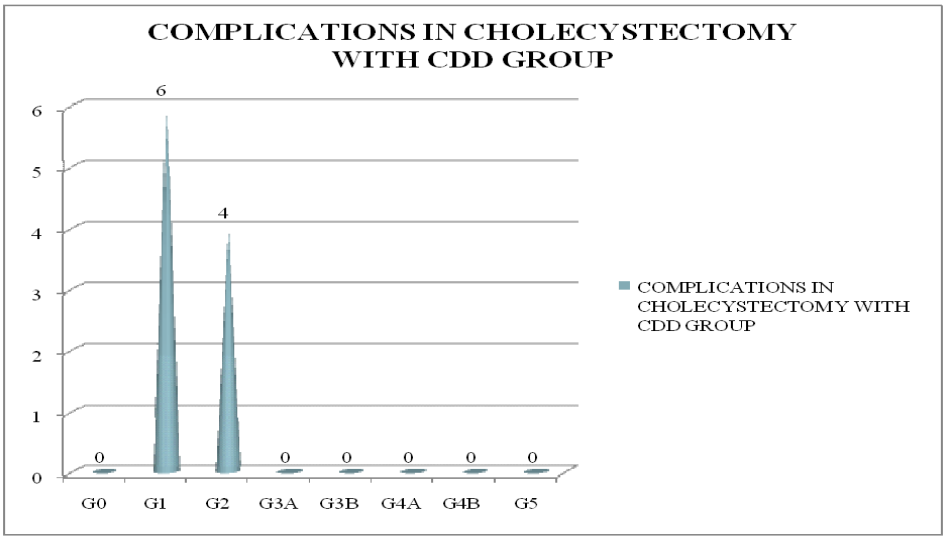

Chart 14: The above chart shows the various number of patients developing different complications undergoing cholecystectomy with choledocho deuodenostomy surgeries. only 10 patients developed complications. 6 patients developed G1 complications and 4 patients developed G2 complications.

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Chart 15: Grading Of Complication In Abdomino Perineal Resection Surgery

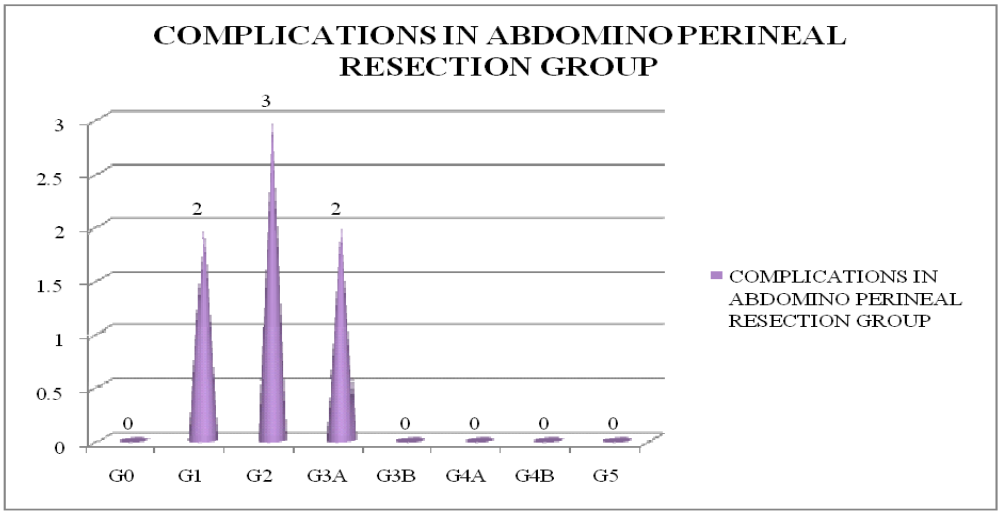

Chart 15: The above chart shows the various number of patients developing different complications undergoing abdomino perineal surgeries. 7 patients developed complications. 2 patients developed G1 complications, 3 patients developed G2 complications and 2 patients developed G3A complications.

Chart 16: Grading Of Complication In Abdominoperineal Resection Surgery

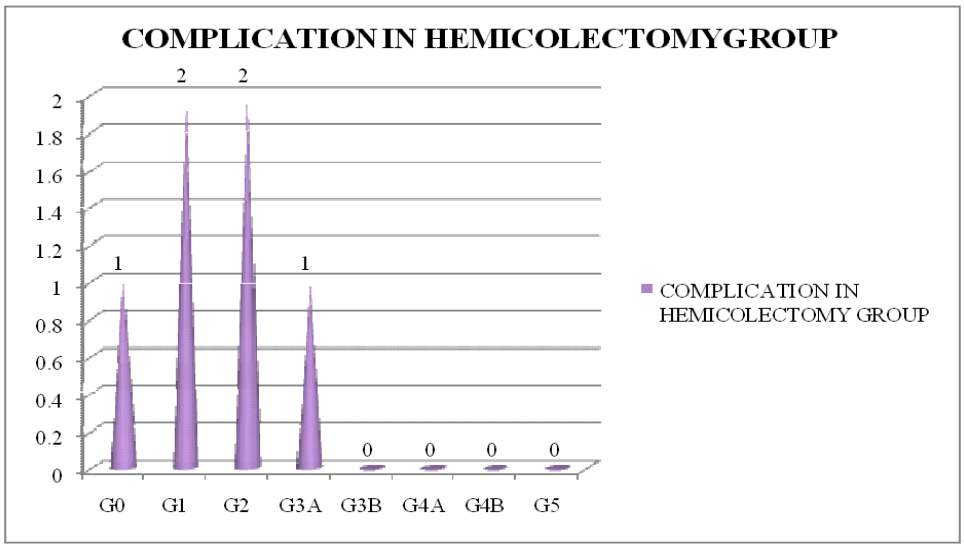

Chart 16: The above chart shows the various number of patients developing different complications undergoing hemicolectomy surgeries. 6 patients developed complications. 1 patient developed no complications, 2 patients developed G1 complications, 2 patients developed G2 complications and 1 patient developed G3A complications. no mortality was observed. In other surgeries, total no of patients operated were minimal in this time duration. hence complications could not be graded significantly.

DISCUSSION

This prospective study involving 214 patients admitted for abdominal pathology who underwent either open or laparoscopic major abdominal procedures included different age group of patients with different co morbid conditions [8]. Post operative complications were studied in each of these patients and graded according to Clavein-Dindo classification. In this classification, grades I and II include only a

minor deviation from the normal postoperative course which can be treated with drugs, blood transfusions, physiotherapy and nutrition, while grades III and IV require surgical, endoscopic or radiologic intervention, and intermediate care or ICU management [9]. This grading system was objective and simple because the data recorded in our database were easily converted into this new classification [10]. First, we noted that using this system, the rate of patients with any deviation from the normal postoperative course was very high (only 84.2%); 15.8% of the patients had an uneventful postoperative course. In the literature, the lack of a stratified grading system for complications after major abdominal surgeries has not allowed proper evaluation of the surgical outcome [11]. Probably, for this reason, the overall postoperative morbidity rate after major abdominal surgeries were reported as lower. In this study some procedures which are exclusively done by open procedure like gastrectomy, hemi colectomy (right and left), Cholecystectomy with CDD, TV +GJ + JJ, Abdomino perineal resection, Whipples procedure, High anterior resection were studied. the complications of above procedures were analyzed and graded by Clavein-Dindo classification system. Some common abdominal surgeries which are done by open and laparoscopic method included in this study were Cholecystectomy, Ventral Hernia, Inguinal Hernia (scrotal abdomen). The complication grades of open and lap approaches of the above surgeries were analyzed in this study [12]. Influence of co morbidity in the development of post operative complication were analyzed by Clavein-Dindo classification. In this study, the complications belonged more frequently to grades I and II, constituting about two-thirds of the patients with complications requiring only pharmacological treatment, whereas one-third of the patients required management in the ICU or interventional treatment [13]. The morbidity increased for grades II-III, demonstrating that the Clavien-Dindo classification is a useful tool for distinguishing among the increased grade of severity of the complications. In this study population (n=214), 34 patients (15.8%) had no complication, 180 patients developed complications during their post operative period among which 165 patients (76%) developed Low Grade complications, 17 patients (6.9%) developed High Grade complications. among low grade, Grade 1 is most common. While comparing complication grades in both open and laparoscopic elective major abdominal surgeries, laparoscopic group (n=18.80%) did not develop any complications when compared with the open group (n=12.37%). according to Clavein-Dindo classification [14]. In this study, majority of patients operated by laparoscopy and open method developed only low grade complications, most commonly Grade 1(open n=32; lap n=76), In open methods Grade 1 &2 were almost equal in number(grade 1=32;grade 2=31) while only very few patients developed high grade complications which is comparatively more in open surgery group (open, n=77%; lap, n=76.92%) [15]. No mortality was recorded in Laparoscopic group. 2 patients (1.94%) expired in open group. Regarding most commonly occurring complication, In grade 1, post operative nausea, vomiting, pain are most commonly encountered problems. In grade 2, two leading complications were surgical site infection and hemorrhage requiring blood transfusion. The grades 3 to 5 complication rate was within the range described in the literature, and the rate of grades 1 and 2 complications was substantially higher. However, these grades 1 and 2 complications were not associated with a substantially longer hospital stay. patients with no complications and patients with grade I are similar because grade I did not include particular pharmacologic treatment but only wound infections which opened at bedside [16]. When observing the co morbid status in patients with complications (n=214), 63% (n=135) patients had no co morbidity. 19.25%(n=26) patient did not develop any complication, 80%(n=108) patients developed Low grade complications, only 0.74% developed High grade complications [17]. Among the Low-grade complications in both open and laparoscopic technique Grade 1 is most common. Post operative fever, vomiting, pain are the most common complications. Out of 37% (n=79) patients with co morbidity, only 10% patients did not develop any complication. 72% (n=57) patients developed Low grade complications. 17.72% patients developed High grade complications. From this it was observed that there was nearly 20% increased risk of High-grade complications in patients with co morbidity group. among this patient with co morbidity especially two or more than 2 co morbidity had highest chance of High grade complications [18]. In gastrectomy surgeries, Out of 19 patients15% of patients (n=3) did not develop any complication, 78.94% (n=15) patients developed Low grade complications of which Grade 2 is most common. Most common in grade 2 was found to be blood transfusion. Only 0.05% patients developed High Grade complications [19]. In Cholecystectomy with CDD surgeries, All the patients developed Low grade complications only of which Grade 1 is most common. Most common in grade 1was found to be Post operative Nausea and Vomiting. In Abdomino Perineal Resection surgeries, all the patients were in Low Grade complication group out of which one third of patients belongs to Grade 2 most common in grade 2 was found to be blood transfusion. one third of patients developed wound infection (grade 3a) which needs secondary suturing at bedside [21]. In Hemicolectomy surgeries, All the patients developed Low grade complications only of which Grade 1& 2 were equal. Most common in grade 1was found to be Post operative Nausea and Vomiting where as it was Blood transfusion in case of Grade2.In other surgeries,

total no of patients operated were minimal in this time duration. hence complications could not be graded significantly [20].

CONCLUSION

This study demonstrates that Clavien-Dindo classification is a effective and a useful tool for reporting complications following abdominal surgeries in a simple way. any deviation from the normal course following a surgery can be easily distinguished by this classification. it also clearly differentiates the complication severities from one another. this classification continues to be of great importance in analyzing the development of complications among various surgeries. this study also shows that open and laparoscopic surgeries performed in our hospital developed only low-grade complications. only few high- g r a d e complications were recorded which were more common in open surgeries compared to laparoscopic surgeries. high grade complications when usually seen in patients with multiple co morbidity.

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