Evaluation of the association of the preoperative severity and the intraoperative complexity (using the Parkland Grading Scale) in the Patients Treated with Laparoscopic Cholecystectomy in Mexico City

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Background: The Tokyo guidelines(TG) standardized the diagnosis and severity of acute cholecystitis(AC) using preoperative parameters that don't necessarily translate to an intraoperative complexity by inflammation and fibrosis around the gallbladder, the Parkland Grading Scale(PGS) evaluates this complexity. Our study aimed to evaluate the relationship between the TG and the PGS.

Methods: A retrospective study was performed analyzing the data and videos from patients with AC treated with a Laparoscopic Cholecystectomy(LC) from 8 hospitals in Mexico City for 2 years.

Results: A total of 390 patients and videos were collected; 52 were excluded due to missing data or problems with the video; leaving 338 patients for analysis; all patients met the criteria for acute cholecystitis by the Tokyo Guidelines and were treated with an emergency laparoscopic Cholecystectomy. 234 patients were women (69.23%), and the mean age of the sample was 49.61(SD±11.82) years. Preoperative severity was assessed using the TG; 122(36.09%) patients were classified as Grade 1 AC, 170(50.3%) grade II, and 46(13.61%) grade III. The interobserver coefficient of the assessment of the PGS by the two surgeons was 0.809; the most frequent classification was a PGS of 3 with 134 patients (39.64%), using the PGS as a continuing variable the mean PGS was 3.63 (SD 0 .96). However, when dichotomizing the PGS the majority of the patients (176,52.07%) presented a complex LC(CLC, PGS of 4 or 5). Statistically significant differences were found when comparing the PGS) and the frequency of CLC between the groups of preoperative severity (p=<0.001). Using logistic regression an increase in the TG wasn't significantly associated with an increase of the PGS (OR 1.05, CI 95% 0.36-3.04, p=0.914) or presenting a CLC (OR 1.39 CI 95% 0.76-2.55, p=0.276). Highlighting that a Severity grade of 1 was a significant protective factor associated with not presenting a CLC. Evaluating the variables that classify the severity following the TG we found as a significant risk factor to presenting a CLC the Leukocytes count more than >18,000 (OR1.91,p = 0.0047), palpable mass in RUQ (OR3.12,p = 0.004), highlighting that the presence of symptoms for more than 72 h wasn't significant (OR1.54,p=0.21).

Conclusion: Although no significant association was found, recognizing the severity preoperatively and the intraoperative complexity would let the surgeon establish strategies like bailouts procedures or ask for assistance before the presentation of complications and their added morbidity.

References
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Surical Variables divided by the Severity following the Tokyo Guidelies					
	Grade I (n=122, 36.09%)	Grade II (n=170, 50.3%)	Grade III (n=46, 12.61%)	Total (N=338)	
Sex					
Female	86 (25.44%)	114 (33.73%)	34 (10.06%)	234 (69.23%)	p= 0.79
Male	36 (10.65%)	56 (16.57%)	12 (3.55%)	104 (30.77%)	
Age	47.88 (SD 10.55)	49.35 (SD 10.81)	55.17 (SD 16.74)	49.61 (SD 11.84)	p=<0.01
Parkland Grading Scale (PGS)					
1	2 (0.59%)	6 (1.78%)	0	8 (2.37%)	p=<0.01
2	12 (3.55%)	4 (1.18%)	4 (1.18%)	20 (5.92%)	
3	68 (20.12%)	50 (14.79%)	16 (4.73%)	134 (39.64%)	
4	32 (9.47%)	60 (17.75%)	12 (3.55%)	104 (30.77%)	
5	8 (2.37%)	50 (14.79%)	14 (4.14%)	72 (21.3%)	
Complex laparoscopic Cholecystectomy using the PGS					
nonCLC (PGS 1-3)	82 (24.26%)	60 (17.75%)	20 (5.92%)	164 (47.94%)	p=<0.01
CLC (PGS 4,5)	40 (11.83%)	110 (32.54%)	26 (7.69%)	176 (52.07%)	
Estimated blood loss	143.44 (SD 69.06)	166.82 (SD 84.4)	111.3 (SD 89.96)	150.82 (SD 81.78)	p=0.17
Total laparoscopic time	73.19 (SD 22.5)	70.12 (SD 26.98)	56.52 (SD 32.61)	69.38 (SD 26.69)	p= 0.08
Time before cliping the cystic structures	26.52 (SD 14.30)	28.6 (SD 15.15)	26.47 (SD 15.98)	27.56 (SD 14.91)	p=0.79
Conversion to open surgery	2 (0.59%)	10 (2.96%)	12 (3.55%)	24 (7.1%)	p=<0.01

* PGS= Parkland grading scale, nonCLC= non complex Laparoscopic Cholecystectomy, CLC= Complex Laparoscopic Cholecystectomyde Parkland; DS= Desviacion estandar

Asociation between the TG severity and presenting a CLC (PGS 4 or 5)			
Higher TG severity	1.39	0.276	0.76-2.55
Tokyo 1	0.28	0.04	0.14-0.55
Tokyo 2	2.01	0.06	1.51-2.03
Tokyo 3	1.23	0.646	0.5-2.98

Diagnostic viariables asociated to presenting a CLC (TG GII)					
Variable	n	%	OR	p	CI 95%
Leukocytosis	122	36.09%	1.91	0.047	1.00-3.63
RUQ mass	80	23.67%	3.12	0.004	1.44-6.79
Symptoms >72hrs	90	26.63%	1.54	0.21	0.77-3.09
Local inflamation by USG	72	21.30%	2.52	0.021	1.14-5.54
Number or Organic failures (TG GIII)					
0	292 (83.39%)		1	16 (4.73%)	
1	24 (7.10%)		3	6 (1.78%)	