

## Patterns of acute surgical inflammatory processes presentation of in the COVID-19 outbreak (PIACO Study): Surgery may be the best treatment option

### Editor

Since the first case of SARS-CoV-2 was confirmed, lives were altered in many ways, elective surgery was discontinued and outpatient clinics were cancelled or altered to phone consultations<sup>1-5</sup>. Anecdotal evidence suggests a reduction of acute surgical admissions, however there is paucity of studies looking into the causative factors. It was anticipated by some that as a result of the 'lock-down' patients would deteriorate at home without access to hospital treatment, leading to late presentations.

We performed a multicentre study at sixteen hospitals aiming to evaluate the patients with acute surgical inflammatory processes (ASIP) (appendicitis, cholecystitis, diverticulitis and perianal abscesses) during the COVID-19 outbreak and compare it with the same timeframe in 2019. Consecutive patients from March 14th 2020 (date of the declaration of the state of alarm by Spanish Government) until the May 2th 2020 (beginning of the gradual de-escalation plan) were included. In total, 521 patients were treated for ASIP in 2020 (cases) and 822 in 2019 (controls). This represents a 36.6% (appendicitis -33.4%, cholecystitis -22.9%, diverticulitis -60% anal perianal abscesses -41%) reduction. The higher reduction was observed in mild and moderate cases (-49.3% and -19.5%, respectively), with a similar number of severe cases (86 vs. 97; variation -11.3%). The percentage of patients treated surgically was lower in 2020 (380 [72.9%] vs. 658 [80%];  $p = 0.002$ ). Although the cases group had more complications (117 [22.5%] vs. 101 [12.3%];  $p < 0.001$ ) the number of severe complications (grade 3

Variable	OR	95% CI	p-value
Severe complications			
CCI	1.193	1.031-1.380	<b>0.018</b>
Non-surgical treatment			
Surgical treatment	2.081	0.765-5.659	0.151
COVID negative			
COVID positive	2.628	0.961-7.189	0.060
Severity at diagnosis - Mild			
Moderate	2.574	0.893-7.421	0.080
Severe	5.091	1.757-14.753	<b>0.003</b>

or higher) was similar (37 [7.1%] vs. 45 [5.5%];  $p = 0.225$ ).

Thirty-seven out of three hundred forty-five patients tested for COVID-19 (66.2%) were COVID-19 positive (10.7% of tested and 7.5% of total). Patients positive for COVID test were more commonly classified as "severe" at diagnosis but without reaching statistical significance (11 [29.7%] vs. 47 [15.4%];  $p = 0.072$ ). These patients were treated surgically less frequently (17 [45.9%] vs. 219 [71.1%];  $p = 0.002$ ). Although patients diagnosed with COVID-19 experienced a higher number of severe complications (7 [18.9%] vs. 22 [7.1%];  $p = 0.024$ ), a logistic regression analysis showed this to be associated with CCI and severity at presentation instead of COVID-19 status instead (Table 1). Mortality was similar for COVID-19 positive and negative patients (2 [5.4%] vs. 3 [1%];  $p = 0.091$ ). Patients waited longer before presenting to hospital after the onset of symptoms (> 3 days: 252 [48.4%] vs. 276 [33.7%],  $p < 0.001$ ; > 7 days: 79 [15.2%] vs. 68 [8.3%],  $p < 0.001$ ) and were operated on less during the pandemic (380 [72.9%] vs. 658 [80%];  $p = 0.002$ ).

Our conclusion is that, whilst the COVID-19 outbreak led to delayed presentations and selected more severe ASIP cases, the positive COVID-19 status itself did not have a direct impact on either mor-

bidity or mortality. Based on these results, we recommend that treatment of ASIP cases to retrovert to that of pre-COVID era (*i.e.* surgery > conservative management).

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