Nomenclature of Pancreatic Fluid Collections following Acute Pancreatitis: Need to Further Revise the Atlanta Classification System!

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Abstract

A better understanding of the disease pathophysiology, improved imaging modalities, and the development of minimally invasive interventions led to the revision of the Atlanta classification and new terminologies for the pancreatic fluid collections (PFCs) occurring in acute pancreatitis. Peripancreatic necrosis (PPN) or extra-pancreatic necrosis (EPN) has been reported as a distinct morphological entity with a better outcome than combined pancreatic and peripancreatic necrosis as well as pancreatic parenchymal necrosis alone and slightly worse than acute interstitial pancreatitis. In this news and views, we discuss a study that compared the morphological features and outcomes of endoscopic drainage of walled off necrotic collections developing after EPN alone with those developing after PN with or without EPN.

Keywords

- endosonography
- necrosectomy
- stent
- walled-off necrosis

A better understanding of the disease pathophysiology, improved imaging modalities, and the development of minimally invasive interventions led to the revision of the Atlanta classification and new terminologies for the pancreatic fluid collections (PFCs) occurring in acute pancreatitis. Based upon the presence or absence of an encapsulating wall and the morphological nature of its contents (solid or liquid), the PFCs were classified as acute peripancreatic fluid collection, acute pseudocyst, acute necrotic collection (ANC), and walled-off necrosis (WON).[1] These terminologies were based upon the fact that PFCs occurring in acute interstitial pancreatitis (AIP) and acute necrotizing pancreatitis (ANP) had differing morphology, natural history, and response to intervention with ANC and WON requiring aggressive drainage strategy.[2–4]

Studies over the last few years have reported that pancreatic necrosis and subsequent necrotic collections are a heterogeneous group with variable natural history and response to interventions and therefore need to be further re-classified. Peripancreatic necrosis (PPN) or extra-pancreatic necrosis (EPN) has been reported as a distinct morphological entity with a better outcome than combined pancreatic and peripancreatic necrosis as well as pancreatic parenchymal necrosis alone and slightly worse than AIP.[5–7] Therefore, it has been suggested that acute pancreatitis should be morphologically sub-classified as AIP, ANP, and EPN alone.

Similarly, WON has also been reported as a heterogenous group with varying solid and liquid content.[8] In a study done by us earlier in patients with WON, we had reported that patients with $< 10\%$ necrotic debris needed a single session of endoscopic drainage, whereas patients with 10 to 40% necrotic debris needed multiple sessions of drainage for a successful outcome and patients with $> 40\%$ necrotic debris needed direct endoscopic necrosectomy (DEN) or surgical necrosectomy.[2] Because of varying therapeutic approaches, the following subclassification for WON has been suggested: acute post necrotic pseudocyst for collections with no or

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< 10% solid content; walled-off liquid necrosis for collections with 10 to 40% solid content; walled-off solid necrosis for collections with > 40% solid content.[8] Also, as EPN and PN have varying clinical courses, the organized collections developing later in the course of illness are also likely to have different clinical course and outcomes. In this news and views, we discuss a study conducted at our center that compared the morphological features and outcomes of endoscopic drainage of WON collections developing after EPN alone with those developing after PN with or without EPN.[9]

In this retrospective single-center study, outcomes of endoscopic transmural drainage were compared in 71 patients (57 males; mean age 38.6 ± 11.5 years) who had WON developing after ANP with 16 patients (12 males; mean age 34.5 ± 10.8 years) who developed WON after EPN alone. In this study, pancreatic necrosis was defined as focal or diffuse non enhancement of the pancreas on contrast-enhanced computed tomography (CECT) done between days 4 and 7 of the onset of illness, whereas EPN was defined as extra-pancreatic changes that were more than simple fat stranding.[10] Subjects with combined necrosis (i.e., concomitant PN and EPN) were designated as Group 1 and those with EPN alone were defined as Group 2. The primary outcome evaluated in this study was to compare the time taken for resolution of WON between the two groups as documented on cross-sectional imaging following endoscopic drainage. The other outcome measures compared between the two groups were WON size, percentage of solid debris, need for metallic versus plastic transmural stents, or DEN and adverse events associated with endoscopic drainage.

The demographic profile was comparable between the two groups but patients in Group 1 more frequently presented with fever than in Group 2. Patients in Group 1 had significantly larger size (11.7 ± 2.8 vs. 9.5 ± 2.03 cm, $p = 0.014$) of the collection with a higher mean proportion of solid debris (30.4 ± 9.8 vs. $13.7 \pm 7.2\%$, $p < 0.01$) in comparison to collections in Group 2. As expected, main pancreatic duct disruption was found in patients in Group 1 only and 78.9% of patients in this group had duct disruption. The mean time of intervention since the onset of the disease was similar in both groups as was technical and clinical success following endoscopic drainage (100% in both groups). Metallic transmural stent placement and DEN were required in more patients in Group 1 but the difference was not statistically significant. Four patients developed bleed during drainage, which occurred in Group 1. The time to resolution was significantly longer in group 1 (28.6 ± 5.2 vs. 19.3 ± 4.17 days, $p < 0.01$) than in Group 2. The time to resolution showed significant and positive correlation with the size of WON ($r = 0.629$, $p < 0.01$) and solid debris content ($r = 0.647$, $p < 0.01$), both of which were significantly higher in patients in Group 1. Considering that PFC in patients in Group 2 resolved earlier with less-frequent need for aggressive endoscopic drainage techniques such as DEN compared with WON developing in ANP, the authors proposed that walled-off necrotic collection developing in patients in EPN alone may be labeled as walled-off extra pancreatic necrosis (WOEPN).

Commentary

The revised Atlanta classification took into consideration the fact that acute pancreatitis is a disease of a varying spectrum of severity ranging from mild to moderate and severe disease with the radiological morphology of pancreatic necrosis and consequent PFCs differing according to the severity of the disease. The PFC developing in the setting of AIP are expected to be of liquid consistency as there is no pancreatic necrosis, whereas collections developing in the setting of ANP are composed of both solid and liquid content and therefore the terms acute peri-pancreatic fluid collection, acute pseudocyst, ANC, and WON were proposed for these morphologically differing collections. However, studies conducted after the publication of revised Atlanta classifications have reported that ANP is not a homogenous disease entity with a subgroup of patients having EPN alone tend to have a better prognosis in terms of organ failure, need for intervention, and mortality.[7,10] Extrapolating the favorable prognosis among patients with predominantly EPN, the authors of the currently discussed study have shown that the morphology as well as the outcome of drainage of necrotic collections in patients with EPN alone is different from those of patients with combined pancreatic and extra-pancreatic necrosis. They have reported that WOEPN has lesser solid necrotic debris than WON and its endoscopic drainage is associated with better outcomes than patients with walled-off pancreatic necrosis. The revised Atlanta classification was designed to standardize terminologies in acute pancreatitis across specialties. Over the last decade, it has immensely helped in the proper diagnosis and management of patients with acute pancreatitis. Development of minimally invasive interventions and high-resolution imaging modalities such as endoscopic ultrasound will result in better understanding of the natural history, morphological differences in local complications, and clinical outcomes resulting in the need to further revise the Atlanta classification. The classification and nomenclature of acute pancreatitis and its complications is a work in progress!

Conflict of Interest
None declared.

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