



## Retroperitoneal Air Post ERCP

Aaron Kisiel, Virginia Summerour and Simon R Bramhall\*

Hereford County Hospital, Hereford, United Kingdom

Endoscopic retrograde cholangiopancreatography (ERCP) has evolved over the years with increasing practitioner experience and technological advances. These advances have led to a safer and more satisfactory outcome for many patients, with a reduction in requirements for complex biliary surgery, shorter length of stay and more cost effective healthcare.

Practitioners are now able to successfully remove much larger bile duct stones using a combination of endoscopic sphincterotomy and balloon sphincteroplasty. These techniques have enabled sphincteroplasty up to 20 mm to be carried out in selective cases [1]. The complications associated with these techniques are acceptable but never the less complications can and do occur. The commonest infective or inflammatory complications are pancreatitis and perforation [2].

There are however, a group of patients who will get free retroperitoneal air following upper gastrointestinal endoscopy and more specifically ERCP in whom this finding is benign and not associated with any pathological consequence. This could be between 14 and 29% of patients following therapeutic ERCP and does not appear to be related to the length of the procedure, the size of the sphincterotomy, the presence of associated hyper-amylasaemia nor the presence of duodenal diverticula [3,4]. In an attempt to classify post-ERCP duodenal perforation Stapfer, et al. [5] classified this type of perforation as Type IV but they did go on to admit that this was not a true perforation and required no intervention [5].

In an era of increasing availability and use of cross sectional imaging many more patients with abdominal pain post-ERCP will be subject to a computerized tomography (CT) scan and therefore the likelihood of seeing free retroperitoneal air is increased. These pockets of air can be seen anywhere in the retroperitoneum but will commonly be seen within Gerota's fascia over the right kidney, sometimes in close proximity or in continuity with air adjacent to the duodenum but not exclusively.

It is important to differentiate between free air (of no clinical significance), free air associated with a retroperitoneal duodenal perforation and post-ERCP pancreatitis. Each will require a different treatment pathway; the former requires no treatment at all.

Free retroperitoneal air (of no clinical significance) will be associated with rapidly improving (or no abdominal symptoms). Any symptoms associated with the finding are coincidental and require another explanation. This radiological finding will not be associated with raised inflammatory markers (C-reactive protein and white cell count), unless they can be explained by some other cause such as post-ERCP pancreatitis (which should be visible on the CT scan) or cholangitis (which should be associated with abnormal liver function tests). Free retroperitoneal air on its own, requires no treatment and can be safely ignored.

Free retroperitoneal air that is associated with a duodenal perforation will always be immediately adjacent to the duodenum and associated with significant inflammation in Gerota's fascia, a probable fluid collection/abscess (although this may not have had time to develop if the initial CT scan is very early post-procedure). This will also be associated with raised inflammatory markers. Post-ERCP duodenal perforation carries with it a high mortality and is initially managed conservatively with intravenous antibiotics, keeping patients nil by mouth, parenteral nutrition and best supportive care although salvage surgery might be required [6]. The clinical path-

**\*Corresponding author:** Simon R Bramhall, Department of Surgery, Hereford County Hospital, Union Walk, Hereford, HR1 2ER, United Kingdom, Tel: +44-(0)-7976-278549, Fax: +44-(0)-1432-364102, E-mail: [Simon.Bramhall@wvt.nhs.uk](mailto:Simon.Bramhall@wvt.nhs.uk)

**Received:** November 10, 2017; **Accepted:** January 24, 2018; **Published online:** January 26, 2018

**Citation:** Kisiel A, Summerour V, Bramhall SR (2018) Retroperitoneal Air Post ERCP. J Gastrointest Hepat Surg 1(1):7-8

way will usually require regular and repeated cross-sectional imaging with both oral and intravenous contrast to assess for resolution or the requirement for drainage of developing abscesses. If there is initial doubt about the significance of free retroperitoneal air then serial imaging and evolution will easily discriminate between free air of no clinical significance and that associated with a duodenal perforation.

Hyperamylasaemia post-ERCP can be found in up to 16.5% of patients within 24 hours of an ERCP, only a small fraction of these patients will have post-ERCP pancreatitis [7]. The diagnosis of pancreatitis would traditionally require 2 of the following 3 criteria: An appropriate clinical picture, associated with a raised serum amylase and/or lipase but in 2017 it is reasonable to include cross sectional imaging compatible with the diagnosis where this is available. In the group of patients under discussion the presence of free retroperitoneal air, radiological features suggestive of pancreatitis, a raised serum amylase/lipase and raised inflammatory markers would point towards post-ERCP pancreatitis rather than a post-ERCP duodenal perforation. If doubt remains then sequential CT imaging and evolution of the disease process should help to confirm the diagnosis. A duodenal perforation would inevitably lead to a retroperitoneal collection in the right side of the abdomen, involving Gerota's fascia, the retroduodenal area and possible down the right paracolic gutter. While such collections can occur with necrotizing pancreatitis they are uncommon and would usually develop much later in the disease pathway. Most patients with post-ERCP pancreatitis will have a self-limiting condition which will resolve quickly. Management of acute pancreatitis is more controversial but would usually involve aggressive hydration, most patients can receive enteral nutrition (which can be supported if required), best supportive care and the use of

sequential imaging depending on clinical course. The use of antibiotics is limited to infected pancreatic necrosis or an extrapancreatic infection.

It is therefore important to recognize that retroperitoneal air post ERCP might be a coincidental finding and not the cause of a patient's symptom or that the free air might be coincidental to a diagnosis of post-ERCP pancreatitis or cholangitis. Careful clinical evaluation of the patient, evaluation of all blood results and detailed review of a CT scan in light of all of these factors is crucial in achieving the correct diagnosis. Without such detailed and careful evaluation the patient might receive an incorrect diagnosis and therefore inappropriate treatment.

## References

1. Stefanidis G, Christodoulou C, Manolakopoulos S, et al. (2012) Endoscopic extraction of large common bile duct stones: A review article. *World J Gastrointest Endosc* 4: 167-179.
2. Szary NM, Al-Kawas FH (2013) Complications of endoscopic retrograde cholangiopancreatography: How to avoid and manage them. *Gastroenterol Hepatol (N Y)* 9: 496-504.
3. Mendez MA, Mata JGA, Mladineo CF, et al. (2016) Retroperitoneal air after ERCP with sphincterotomy: Frequency and clinical significance. *Open Journal of Gastroenterology* 6: 31-38.
4. Genzlinger JL, McPhee MS, Fisher JK, et al. (1999) Significance of retroperitoneal air after endoscopic retrograde cholangiopancreatography with sphincterotomy. *Am J Gastroenterol* 94: 1267-1270.
5. Stapfer M, Selby RR, Stain SC, et al. (2000) Management of duodenal perforation after endoscopic retrograde cholangiopancreatography and sphincterotomy. *Ann Surg* 232: 191-198.
6. Wu HM, Dixon E, May GR, et al. (2006) Management of perforation after endoscopic retrograde cholangiopancreatography (ERCP): A population-based review. *HPB* 8: 393-399.
7. Christoforidis E, Goulimaris I, Kanellos I, et al. (2002) Post-ERCP pancreatitis and hyperamylasemia: Patient-related and operative risk factors. *Endoscopy* 34: 286-292.