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Pylephlebitis: Incidence and prognosis in a tertiary hospital

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ABSTRACT

Objectives: Septic thrombophlebitis of the portal vein or its branches, most often secondary to intra-abdominal infection is known as pylephlebitis. The frequency and the prognosis of this complication are unknown. The aim of this study was to determine the global and relative incidence of the most frequent intra-abdominal infections and the real prognosis of this disease.

Methods: An observational retrospective study was conducted in a tertiary care hospital (University Hospital of Salamanca, Spain) from January 1999 to December 2008.

Results: A total of 7796 patients with intra-abdominal infection were evaluated, of whom 13 (0.6%) had been diagnosed with pylephlebitis. Diverticulitis was the most frequent underlying process, followed by biliary infection. Early mortality was 23%. Survivors had no recurrences, but one of them developed portal cavernomatosis.

Conclusions: Pylephlebitis is a rare complication of intra-abdominal infection, with a high early mortality, but with a good prognosis for survivors.

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Pileflebitis: incidencia y prognosis en un hospital terciario

RESUMEN

Objetivos: La tromboflebitis séptica de la vena porta o de sus ramas se conoce como pileflebitis. En la mayoría de ocasiones es secundaria a infecciones intraabdominales. La frecuencia y el pronóstico de esta complicación infecciosa no son conocidas. El objetivo de este estudio es describir la incidencia global, relativa y el pronóstico real de esta enfermedad respecto a las infecciones intraabdominales más frecuentes.

Métodos: Estudio observacional retrospectivo en un hospital de tercer nivel (Hospital Universitario de Salamanca) desde enero de 1999 a diciembre de 2008.

Resultados: Se evaluó a 7.796 pacientes con infecciones intraabdominales. Trece (0,6%) fueron diagnosticados de pileflebitis. La diverticulitis fue el proceso subyacente más frecuente, seguida de la infección biliar. La mortalidad precoz fue del 23%. Los pacientes que sobrevivieron no presentaron recurrencias, pero uno de ellos desarrolló una cavernomatosis portal.

Conclusiones: La pileflebitis es una complicación poco frecuente de las infecciones intraabdominales. Presenta una elevada mortalidad precoz, pero tiene un buen pronóstico vital para los pacientes que sobreviven.

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Palabras clave:

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Introduction

Pylephlebitis is septic thrombophlebitis of the portal vein or its branches.¹ Although it has been described as a primary form, it normally occurs secondary to infectious intra-abdominal processes. On one hand, these are frequently accompanied by a selective bacteraemia of the mesenteric or portal veins,² which predisposes the development of thrombosis of the portal vein or its branches. On the other hand, the infection may spread to the tree from the biliary tract or superinfected pancreatic necrosis. In addition, pylephlebitis has been seen as an iatrogenic complication secondary to liver biopsy.³

Definitive diagnosis of pylephlebitis requires percutaneous drainage of purulent material from the portal tree.⁴ In practice, however, the diagnosis is based on a high index of suspicion of the presence of an infectious process and visualising intra-abdominal thrombosis or gas in the portal venous system, after ruling out other potential causes of portal thrombosis.⁵

Existing data in the literature so far is based on case reports or short case series. It is probable that the increased use of abdominal ultrasonography and CT may be responsible for the increased number of cases of pylephlebitis diagnosed.^{1,5–7} However, based on these studies it is difficult to estimate the incidence, relative frequency, morbidity and the presence of late complications of different intra-abdominal infections.

The aim of this paper is to describe the incidence of pylephlebitis in our environment, and more fully understand the outcome of such infections and the associated late complications.

Patients and methods

The design was an observational retrospective study. We reviewed the medical records from January 1999 to December 2008 in the University Hospital of Salamanca. A systematic search of pylephlebitis was made in the following diagnoses: (i) acute diverticulitis (CIE IX = 562.11), (ii) acute appendicitis (CIE IX = 540.9), (iii) acute cholecystitis (associated with calculi: CIE IX = 574.8; without calculi: CIE IX = 575.1), (iv) acute cholangitis (CIE IX = 576.1), and (v) bowel perforation (CIE IX = 531.9 and 532.9) only including those who had secondary peritonitis. The diagnosis of pylephlebitis was considered in the patients with the following circumstances: (i) percutaneous drainage of purulent material of portal vein or one of its branches, (ii) the existence of clinical evidence of systemic inflammatory response and radiological findings suggestive of thrombosis of the portal vein or one of its branches in the absence of other causes of portal thrombosis. We excluded patients with advanced cirrhosis, hepatoma or previous diagnosis of portal hypertension or portal thrombosis.

The BACTEC 9240 blood-culture system (Becton Dickinson Diagnostic Instrument Systems, Sparks, MD) with a standard aerobic and anaerobic medium was used in all blood samples.

In the study of thrombophilia, activity antithrombin, protein C and protein S were measured by chromogenic substrate assays (HemosIL, MA, USA). FV Leiden, prothrombin 20210G > A and C677T MTHFR mutations (heterozygous mutation in the methylenetetrahydrofolate reductase gene) were demonstrated by polymerase chain reactions.^{8,9} Lupus anticoagulant (LA) was detected using diluted Russell's viper venom time (LAC screen, Instrumentation Laboratory). LA-positive samples were identified by mixing studies and a confirmation test (LAC confirm, HemosIL, MA, USA). An enzyme-linked immunosorbent assay (ELISA, Diamedix Diagnostics, Inc-Florida) was used to assess aCL (IgG and IgM antibody isotypes) and anti-β2GPI. Levels of homocysteine were measured by high-performance liquid chromatography.¹⁰

We estimated the incidence of pylephlebitis in the Salamanca province out of the total population on the 1st of January 1999

Table 1

Cases of pylephlebitis in the most common intra-abdominal infections.

Aetiology	Cases (no.)	CT available (no.)	Pylephlebitis (no.) (%)
Diverticulitis	834	463	3 (0.34)
Appendicitis	3088	176	3 (0.09)
Biliary infection	3305	808	6 (0.18)
Intestinal perforation	569	97	1 (0.17)
Total	7796	1544	13

(351.128 inhabitants). Statistical tests were carried out using the SPSS Statistical Package 20 (SPSS Inc., Chicago, IL). The results are expressed as means and SDs or medians, ranges and percentages.

Results

During the study period a total of 7796 patients with diagnoses of intra-abdominal infection were admitted (Table 1): 3305 (42.3%) patients with acute infectious disease of the biliary tract (1890 lithiasis with acute cholecystitis, acalculous acute cholecystitis 536, 879 with acute cholangitis), 3088 (39.6%) with acute appendicitis, 569 (7.2%) with abdominal perforation and 834 (10.6%) with acute diverticulitis.

Among these patients, 0.16% of total population met the diagnostic criteria of pylephlebitis. The detected cases of pylephlebitis are summarised in Table 2. The average age of these patients was 64.7 years, with a range of 17–90 years; nine patients were male (69.2%). Pylephlebitis occurred in all the states studied, although the most frequent was in patients with diverticulitis with three cases, followed by infections of the bile duct (cholangitis and/or cholecystitis) in six cases. Pylephlebitis only complicated three (0.09%) cases of appendicitis, although only CT imaging was only performed in 5% of patients diagnosed with appendicitis. The cumulative incidence was 0.37 cases per 100,000 inhabitants/year.

The median time between the initial abdominal infection and hospital admission was three days (range 1–60) and the time between the final diagnosis of pylephlebitis was eight days post-admission (range 1–15). The diagnosis was made in eight patients due to the persistence of SIRS after abdominal surgery and the remaining 10 because the septic symptoms continued after conservative management with antibiotic treatment of intra-abdominal infectious process.

The radiological findings on CT of portal vein thrombosis were seen in thirteen cases and in two of these, gas was also visualised. Thrombosis affecting the superior mesenteric vein was seen in seven (53.8%) cases and in five in the splenic vein (38.4%). Ten patients diagnosed of pylephlebitis had previously ultrasound but this only detected evidence of thrombosis in four (40%).

Blood cultures were positive in eight (61.5%) patients. Microbiological agents most frequently detected were *Escherichia coli* in six cases (46.1%), *Streptococcus viridans* in three (23.0%) cases and one case of each of *Bacteroides* sp., *Enterococcus faecium*, *Enterococcus faecalis* and *Enterobacter cloacae* (7.6%). Only three (23.0%) of our patients had mixed bacteremia. Thrombophilia screening was performed in seven (53.8%) of the thirteen patients included in the study. In three (23.0%) thrombophilia was detected: one patient was heterozygous for factor V Leiden, hyperhomocysteinemia and other two patients had heterozygous mutations for MTHFR. Other prothrombotic factors predisposing to thrombosis included one case of intestinal lymphoma and one of non-cirrhotic alcoholic liver disease.

12 patients received antibiotic treatment (92.3%). Empirical antibiotics were used: (in order of frequency) five had piperacillin and tazobactam (38.4%), three were prescribed carbapenems (23.0%), two had piperacillin, tazobactam and an aminoglycoside (15.2%), or the combination of cephalosporin-metronidazole

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