Original Article

Pancreato-biliary Endoscopic Ultrasound in Opium Addicts Presenting with Abdominal Pain

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Abstract

Objective: Asymptomatic dilatation of bile duct and symptomatic sphincter of Oddi dysfunction have been reported in opium addicts. Except one case report, there is no report in the literature on endoscopic ultrasound (EUS) study of pancreato-biliary system in opium addicts. The aim of the present study was to report the EUS features of pancreato-biliary system in opium addicts presenting with abdominal pain.

Patients and Methods: A total of 15 opium addicts presenting with upper abdominal pain and dilated common bile duct (CBD) and or pancreatic duct (PD) on abdominal ultrasound were included in this study. EUS findings of pancreato-biliary system were analyzed in these patients.

Results: All the 15 patients were males (mean age 53.3 years) presented with upper abdominal pain. Mean duration of opium addiction was 20.1 years. On EUS CBD was dilated in all the patients while PD was dilated in six patients. Gall bladder, liver and pancreatic parenchyma was normal in all these patients. Surface area of papilla of Vater (SPV) was increased in 12 patients.

Conclusion: Opium addiction causes obstruction at ampulla and produces dilatation of bile duct and PD. Bile duct dilatation was seen in all the patients while PD dilatation was seen in few patients. Increase in SPV was a peculiar finding and appears to be as a result of direct effect of opium on ampulla.

Keywords: papilla of Vater; bile duct; endoscopic ultrasound; opium addict; pancreatic duct

INTRODUCTION

It has been shown that opiates cause increase in the basic pressure and frequency of phasic contractions of sphincter of Oddi (SOD) causing increase in internal pressure of common bile duct (CBD) and its dilatation.\(^1,2\) Asymptomatic bile duct dilatation and symptomatic SOD dysfunction have been described in opium addicts.\(^3,4\) Dilated CBD is always seen in these patients while dilated pancreatic duct (PD) is seen in only a few patients. Except one case report\(^5\) there is no literature on endoscopic ultrasound (EUS) study of pancreato-biliary system in symptomatic opium addicts. In the present study, EUS findings of 15 opium addicts presenting with upper abdominal pain and dilated CBD and or PD on abdominal ultrasound (US) were reviewed and presented.

PATIENTS AND METHODS

A total of 50 opium addicts were seen by first author for pain of upper abdomen between February 2011 and 2013. Patients with dilated CBD \((n = 15)\) or PD \((n = 2)\) on abdominal US and those who were subjected to EUS were included in the study. Liver function tests (LFT), serum amylase (S. amylase) and lipase, human immune-deficiency virus (HIV) antibodies, hepatitis B antigen, anti-hepatitis C virus were done in all the patients. Information about the amount of opium intake and route of administration was obtained from patients. History of alcohol intake was taken. One patient having severe pain abdomen was subjected to endoscopic retrograde cholangiopancreatography (ERCP) while all other patients were put on nifedipine 10 mg 3 times a day before meals and were asked to come for follow-up after 1 month. All the procedures were done after taking informed consent from the patients.

11 of these patients were subjected to radial and four patients were subjected to linear EUS using Olympus...
Results

EUS findings of 15 opium addicts having dilated CBD and or PD on abdominal US and those who were subjected to EUS between February 2011 and 2013 were analyzed in the present study. All patients were males and the mean age was 53.3 years (35-70 years). Mean duration of opium addiction was 20.1 years (range: 05-40 years). All patients presented with upper abdominal pain. Aspartate transaminase and alanine transaminase were raised less than 2 times upper limit of normal in five patients. Alkaline phosphatase was minimally raised in two patients. S. amylase and lipase were normal in all the patients. All the patients were negative for HIV, hepatitis B and C. All the 15 patients were having dilated CBD on abdominal US while PD was dilated in two patients. None of the patient in the present series underwent cholecystectomy in the past. Patients were consuming opium orally in various forms. Five patients were consuming crude dried milk of opium, 10-15 g/day, remaining patients were using powder of dried cover of opium fruit (3-5 kg/month) boiling in water and drinking the extract of boiled material (warm decoction). Three patients took alcohol for initial 3-5 years ranging in amount from 120 to 200 mL whisky/day but stopped due to poor financial position. Patient characteristics are shown in (Table 1).

Bile duct was dilated in all the patients (Figs. 1 and 2) while PD was dilated in six patients only (Fig. 3). Increase in SPV was seen in 12 patients (Fig. 4). Dilated bile duct in some cases appeared like choledochal cyst (Fig. 2). There was thickening of the wall of CBD in two patients. Results of EUS findings are shown in (Tab. 2). There was no correlation between CBD diameter and duration of opium addiction but PD dilatation was only seen in patients with more than

### Table 1. Clinical characteristics of patients

| Age (years) | Addiction (years) | Presentation | LFT               | S. amylase/lipase | Abdominal US       |
|------------|-------------------|--------------|-------------------|------------------|--------------------|
| 45         | 15                | Pain epigastrum | Normal            | Normal           | Dilated CBD, normal PD |
| 38         | 20                | Pain RUQ      | Normal            | Normal           | Dilated CBD and PD  |
| 62         | 20                | Pain RUQ, epigastrum | ALT↑, AST↑, ALP normal | Normal           | Dilated CBD, PD normal |
| 70         | 30                | Pain whole upper abdomen | Normal | Normal           | Dilated CBD, normal PD |
| 64         | 15                | Pain epigastrum, LUQ | Normal | Normal           | Dilated CBD, normal PD |
| 55         | 20                | Pain epigastrum | Normal            | Normal           | Dilated CBD, normal PD |
| 60         | 40                | Pain RUQ, epigastrum | ALT↑, AST↑, ALP↑  | Normal           | Dilated CBD, normal PD |
| 40         | 10                | Pain whole upper abdomen | Normal | Normal           | Dilated CBD, normal PD |
| 52         | 15                | Pain whole upper abdomen | Normal | Normal           | Dilated CBD, normal PD |
| 50         | 12                | Pain RUQ, epigastrum | ALT↑, AST↑, ALP normal | Normal           | Dilated CBD, normal PD |
| 60         | 20                | Pain whole upper abdomen | Normal | Normal           | Dilated CBD, normal PD |
| 35         | 5                 | Pain whole upper abdomen | Normal | Normal           | Dilated CBD, normal PD |
| 52         | 20                | Pain whole abdomen | Normal           | Normal           | Dilated CBD, normal PD |
| 67         | 30                | Pain epigastric | ALT↑, AST↑, ALP↑  | Normal           | Dilated CBD and PD  |

RUQ: Right upper quadrant; LUQ: Left upper quadrant; CBD: Common bile duct; PD: Pancreatic duct; ALT: Alanine transaminase; AST: Aspartate transaminase; ALP: Alkaline phosphatase; LFT: Liver function test; US: Ultrasound; S. amylase: Serum amylase
15 years addiction. Pancreatic parenchyma was normal in all the patients and no changes of chronic pancreatitis were seen in any patient. Increase in SPV was maximal in patients with 10-15 years of addiction though it was seen in other addicts also irrespective of duration. Visible liver and gallbladder were also normal. Sublingual administration of nifedipine caused 1-2 mm decrease in diameter of CBD in two of three patients examined.

**DISCUSSION**

It has been shown that opiates cause an increase in the basic pressure and frequency of phasic contractions of SOD leading to increased CBD internal pressure and its dilatation. If the person is exposed to effects of opium for a long time then there may be permanent dysfunction of SOD. Asymptomatic dilatation of bile duct and symptomatic SOD dysfunction with dilated CBD and or PD have been described in opium addicts. These patients present with minimal pain due to high pain threshold because of opium addiction and diagnosis of underlying pancreato-biliary disorder often go unrecognized. In the present series all but one patient presented with mild upper abdominal pain and had dilated bile duct and or PDs on abdominal US. LFTs were minimally elevated in few patients while S. amylase and lipase were normal. Even in the presence of dilated CBD alkaline phosphatase was normal in majority of the patients. It is likely that CBD dilatation in opium addicts occur over a long period (many years) and this may be the reason behind normal alkaline phosphatase in these patients. At our center, we have been seeing symptomatic SOD due to opium addiction over last 13 years and we reported our initial experience in 2002. ERCP in these patients is associated with pancreatitis in up to 25% cases. Since symptoms are mild so we routinely treat these patients with oral nifedipine with good symptomatic relief. Those patients who do not respond to nifedipine are subjected to ERCP. In the present series, also all the patients were put on oral nifedipine and only one patient was subjected to ERCP due to uncontrolled
pain. Eight patients are on more than 1-year follow-up with good symptomatic relief.

There is only one case report in literature where double duct sign and hypertrophy of prescapillary sphincter has been described on EUS in one patient of long standing opium addiction. The peculiar EUS findings in the present series were dilatation of CBD in all the cases while PD dilatation producing double duct sign was seen in six patients (40%) and increased SPV in 80% of patients. It appears that pancreatic sphincter is more resistant to the pharmacological effects of opium and also resistance offered by pancreatic parenchyma may contribute to less dilatation of PD. In the present study, there was no correlation between duration of addiction and the diameter of bile duct, but correlation between duration of addiction and CBD diameter has been reported by Farahmand et al. The bile duct diameter decreased in two of the three patients after sublingual administration of nifedipine meaning thereby that in some of the patients obstruction at the ampulla is dynamic for some duration and may become fixed if addiction continues. PD dilatation was uniform without any beading or strictures and pancreatic parenchyma was normal in all the patients. Dilatation of PD appears to be due to persistent increase in pancreatic sphincter pressure due to pharmacological effect of opium on ampulla, which is constantly under the effect of opium as the addicts consumes opium many times a day as the effect starts decreasing.

Bile duct was maximally dilated in extra hepatic part while IHBR dilatation was seen in only in one patient. In 12 patients increase in SPV was seen. It appears that oral intake of opium may exert some local effect on ampulla resulting in edema of ampulla or direct injury to ampulla. Mohammad Alizadeh et al. have described ulcerative and tumoral features in ampulla in opium addicts. Pre-sphincteric hypertrophy of ampulla was described in a case report by Malay and Balakrishnan. Routine abdominal US is much less sensitive than EUS to outline complete changes in pancreato-biliary system in opium addicts. Additional information like pancreatic parenchymal changes and study of ampulla are possible with EUS. EUS may help in planning endoscopic treatment specially those patients who do not respond to medical treatment. In these patients, sphincterotomy of PD or CBD sphincter can be decided by dilatation of that particular duct.

CONCLUSION

The present study describes peculiar pancreato-biliary EUS features in opium addicts. These features included dilated CBD mainly in extra hepatic part, dilated PD without any other changes of chronic pancreatitis, enlarged ampulla without mass lesion and normal liver and gallbladder. Ampullary enlargement was a peculiar feature in these patients. EUS should be the investigation of choice for complete evaluation of pancreato-biliary system in opium addicts.

ACKNOWLEDGMENTS

The authors are gratefully acknowledge the contribution of Mrs. Shweta Sharma and Dhruv Sharma for help in preparation of the manuscript.

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