Conservative Surgery for Ampullary and Periampullary Carcinoma

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ABSTRACT:

BACKGROUND:

The objective of this study is to present the results of transduodenal resection of ampullary & periampullary carcinoma and compare it with that of by-pass surgery.

METHODS:

Out of (64) patients, (35) were subjected to transduodenal resection and (29) to by-pass procedures during the period 1972-2003 at the Medical City Hospital and Al-Mustansiria Private Hospital, Baghdad.

RESULTS:

(39) Patients were males and (25) were females. Age ranged from (19-80) peak (60-69) years. Fluctuating jaundice, cholangitis and weight loss are main symptoms. Mortality was one case in both procedures. Histopathology were (29) well, (26) moderately and (9) poorly differentiated adenocarcinoma. Chemotherapy was given to (17) of the resection group and (13) patients of the by-pass group. The 2 and 5--year survival after by-pass alone was 44% and 8% compared to 68.6% and 31.4% in the resection group respectively. The size of the tumour, its grade and adjuvant chemotherapy had influence on the prognosis.

CONCLUSION:

Ampullary or periampullary carcinoma can be dealt with by transduodenal resection as a curative or palliative with results comparable to more radical procedures such as Whipple's procedure.

KEY WORDS: Ampullary & Periampullary Carcinoma, Modified Halsted's Procedure, By-Pass, Ffluctuating Jaundice.

INTRODUCTION:

Ampullary & Periampullary neoplasms include a group of tumours arising at or near the ampulla of Vater [1, 2]. Adenocarcinoma is the most common type and the majority are moderately to well-differentiated types [1, 2, 3]. Males are more commonly affected. Such tumours usually present early as they cause obstructive jaundice fairly early in over 80% of cases (1,8). Upper gastrointestinal bleeding is another mode of presentation but duodenal obstruction is a late manifestation [1,3,4]. In about(15%) of patients diabetes mellitus was reported two years prior to diagnosis [1,2]. Palpable liver and gall bladder were observed in (25%) of cases. The average period between appearance of symptoms and diagnosis is usually (4 weeks) [9]. Abdominal ultrasound, CT scan, duodenoscopy ,ERCP and Magnetic Resonance Imaging (MRI) will establish the diagnosis in most cases [10]. MRI is superior to other staging investigations with regards to sensitivity, specificity and overall accuracy [11]. Endoscopic Ultrasoud (EUS) is the best procedure to assess the staging and resectability of ampullary & preiampullary and other tumours in the gastrointestinal tract [12-15] These tumours grow slowly and tend to remain localized. Diagnosis is usually made early in the majority, thereby resection and possible cure is higher than pancreatic malignancy [7] Whipple et al described the operation of pancreatico-duodenectomy (P-D) in 1935 [1]. Pylorus preserving (P-D) is considered the standard procedure for such tumours [1, 2, 4, 5]. The operative mortality of (P-D) has markedly improved in recent years; however, the morbidity remains between (30-40%) [16]. the most common complications being delayed gastric emptying, pancreatic fistula formation and sepsis

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[1, 2, 6] . Such complications may be reduced by pre-operative endoscopic nasobiliary drainage, with or without endoscopic sphincterotomy [5, 17]. Halsted in 1899 described local resection of periampullary carcinoma [18]. This technique had also been described by Chijiiwa-K et al [19]. Such an operation may be applicable if the tumour is early and the patient is not fit for the more extensive Whipple's procedure [1, 4, 5] . The overall 5-year survival after (P-D) for periampullary carcinoma is between (32% - 41%) [2, 4, 8, 20-22].

The average survival after palliative surgery is around five months, while it is (13.2 months) after a Whipple's operation [23]. Adjuvant chemotherapy and radiotherapy have improved the two -year survival [2].

Factors with more favourable prognosis are tumours less than (2cm) at greatest diameter [2,16,24], absence of vascular invasion [2], absence of lymph node metastasis [2,10,16,24,25] and limited need for intra-operative blood transfusion [2,10,26]. Some add absence of neural invasion [27].

In our study, we present the results of Modified Halsted's resection of such tumours in comparison with those after (P-D) and the outcome of palliative by-pass surgery with or without adjuvant chemotherapy.

MATERIAL & METHODS:

Among (580) cases grouped under pancreatic malignancies operated upon by the authors during the period 1972 to 2003 at the Medical City Teaching Hospital (University Hospital), and Mustansiria hospital in Baghdad, (64) were ampullary & periampullary carcinomas. The sex, age and clinical features were reviewed. Diagnosis was confirmed by abdominal ultrasound and duodenoscopy with or without biopsy. Operative findings and surgical procedure were described in details. Histopatholgical type and grade, morbidity and mortality, use of adjuvant chemotherapy and prognosis were reviewed. Recurrence of tumour in the resected group was provided. The correlation between the prognosis and the size, grade of the tumour and the use of chemotherapy was studied. The results of resection or by-pass were compared with other published reports.

RESULTS:

Of the (64) patients with ampullary & periampullary carcinoma operated upon, there were (39 males) and (25 females). Age ranged between 19-80 years. (71.9%) were over (50 years), with a peak incidence between (60-69 years). The relevant clinical features are fluctuant obstructive jaundice, palpable gall - bladder and cholangitis**,** (table (1)).

On exploration, the size of the tumour in its largest diameter was less than (2 cm in 16 (25%)), (2-5 cm in 35 (54.7%)) and more than (5 cm in 13 (20.3%)) patients. Enlarged regional lymph nodes were present in (41 (64%)), and liver secondaries in (five (7.8%)) Patients. Distended gall bladder was present in (49 (76.6%)) patients, and in (8 (12.5%)) it contained gallstones. The common bile duct (CBD) was dilated in all the patients. The diameter ranged between (12 to 35 mm). Trans-duodenal resection of the tumour was feasible in (35 (54.7%)) patients, while the remaining (29 (45.3%)) patients had a by-pass surgery. This by-pass included choledocho-duodenostomy with gastro-jejunostomy in (22 (34.4%)) patients and cholecysto-jejunostomy with gastro-jejunostomy in seven (10.9%) patients.

Modified Halsted's resection was carried out through a transverse duodenotomy using diathermy cutting **(Diag. (1))**. The excision was started superiorly by incising the mucosa over the dilated CBD (2-2.5 cm) from the margin of the tumour. The divided superior edge of the CBD was then sutured to the duodenal wall including the pancreatic bed using (3/0) silk or vicryl interrupted suture, then the inferior cut edge of the CBD was sutured to the superior cut edge of the dilated pancreatic duct and the inferior cut edge of the divided pancreatic duct was sutured to the full thickness duodenal wall. Finally, the anterior and posterior edges of the CBD and pancreatic ducts were sutured to the divided edges of the duodenal mucosa. At the end, the duodenum was reconstructed by suturing it transversely in two layers using (3/0) catgut & vicryl.

Histopathology showed that all tumours were adenocarcinoma ,(29 (45.3%)) well, (26 (40.6%)) moderately and (nine (14.1%)) poorly differentiated. Tumour-free margins were reported in (27 out of 35 (77.1%)) patients who had resection. Of the (35) patients resection group, one (2.9%) died post-operatively from myocardial infarction, early post-operative complications were sepsis in (4 (11.4%)) and internal bleeding in (3 (8.6%)) while late complications were recurrent cholangitis in (7 (20%)) patients,(4 (11.4%)) of them developed stenosis at the site of implantation of the CBD after 2-10 years. One was treated by dilatation through ERCP, while the other three required further surgery (2 by-pass & 1 meatotomy) and all lived for more than five years after the second surgery.

(Fig. (1)) shows the pre and post-operative ERCP of one patient who developed stenosis 10 years

after trans-duodenal resection; he was treated by exploration of the CBD and meatotomy. Of the (17) resectable cases who received chemotherapy, (4 (23.5%)) died within two years, (13 (76.5%)) survived over two years and only (7 (41.2%)) for more than five years, while of the other (17) cases who did not have chemotherapy (1 (5.9%) lost to follow, (5 (29.4%)) died within two years, (11 (64.7%)) patients survived for more than two years and only (4 (23.5%)) lived for over five years. The other (29) patients who had by-pass surgery, one (3.5%) died post-operatively from sepsis, (5) lost to follow within few months and of the remaining 23,(13 (68.4%)) received chemotherapy. The two and five -years survival rate after by-pass surgery was (44% (11 cases)) and (8% (2 cases)) while the resection group was (68.6% (24 patients)) and (31.4% (11 cases)) respectively (Diag. (2)).

The size of the tumour in the those (24) resectable cases who survived two years and more was less than (2 cm in 12 (50%)), (2-5 cm in 11 (45.8%)) and more than (5 cm in one (4.2%)) case. Of the (11 cases) survived over (5) years the size of the tumour was less than (2 cm in eight (72.7%)) and (2-5 cm in three (27.3%)) patients. The histopathological grading in those 24 cases that lived more than 2 years was well differentiated in (11(45.8%)) and moderately differentiated carcinoma in (13 (54.2%)) while among the (11 cases) that lived over (5) years (five (45.5%)) were well differentiated and (six (54.5%)) were moderately differentiated adenocarcinoma.

Local recurrence occurred within (6-36) months in (13 out of 33) cases (39.4%) following resection. Three of them occurred within first year and in (10 between 1-3 years), eight of them received chemotherapy. No recurrence appeared after three years. Survival after palliative by-pass surgery among the (23) followed cases vary from (7-61) months, the (10) without chemotherapy (7-32 (median 21.2)) months while the (13) who received chemotherapy (15-61 (average 32.8)) months (Diag. (2)).

DISCUSSION:

Pancreatic malignancies including ampullary & periampullary carcinoma are considered common tumours of the digestive system in Iraq. In a previous report on (130 cases) with pancreatic malignancies, (19 (14.6%) were ampullary & periampullary [28]. In this study, it represented (11% (64 out of 580)) of pancreatic malignancies.

The age and sex incidence as well as the clinical pictures in our study are comparable to that reported by others [6, 9, 29, 30]. The incidence of recent onset diabetes Mellitus is much lower than that reported by Christ et al [29]. Diagnosis is usually early as obstructive jaundice is the leading presenting symptom; thereby the resectablity rate is higher in comparison to pancreatic carcinoma [8, 24, 25]. This is shown in our series as (91.7%) presented with fluctuating jaundice. Of (35) locally resected tumours, (27, (77.1%)) patients had tumour-free margins on histopathology. Even so, ((13) of those (35)) developed local recurrence within three years. Some authors correlate the survival with the resection margin status and residual tumour [10, 16, 24], while others disagree [17]. The post-operative mortality rate in our series of (2.9%) compares favourably. Others reported figures between (3.8-23.8%) following Whipple's procedure [9, 22, 23, 26, 31, 35]. Some authors stated that palliative resection is the treatment of choice for carefully selected patients with irresectable periampullary carcinoma and provides better palliation than non-operative biliary drainage or by-pass procedures [6, 23]. Nobili et al stated that the five-year survival rate was significantly related to the intent of the operation whether palliative or curative [36]. In our series, the intent was curative for the resected group. Christophe et al reported that resection even if palliative gives a better survival rate than mere by-pass procedures [37]. The improvement of the survival with the use of chemotherapy postoperatively found in our series was reported by Chan et al [27] who concluded that adjuvant chemotherapy is a significant factor for longer survival. Out of (24) patients who survived two years or more, (17 (70.8%)) received chemotherapy, while out of (11) patients who survived more than five years, (seven (63.6%)) received chemotherapy.The overall mean survival period in our series following modified Halsted's resection was (39.8 months). This compares with a range between (10.1-35.5 months) following Whipple's procedure [17, 22, 23, 32, 37,39]. The tumour size correlated with the prognosis in our series is in agreement with others [23, 24]. The tumour grading which had been correlated with the survival in this series was also reported by others [10, 16]. Al-Talmini et al reported that moderately to well-differentiated tumours had a more favourable prognosis [26]. Local recurrence of (46%) after modified Halsted's procedure within (6-36 months) in our series compares with (69%) within (4-30 months) following Whipple's procedure reported by Ahren et al [40] and (81%) by Shyr et al [33]. No local or distant spread was seen in any case who survived three years and more.

CONCLUSION:

trans-duodenal resection by a modified Halsted's technique for ampullary and periampullary carcinoma compares favourably with the major resections. It can be applied as a palliative or curative procedure with less morbidity and mortality. Also, smaller tumours of low grade and using adjuvant chemotherapy are positive prognostic factors.

Table (1) Relavent clinical features in (64 cases) with ampullary & periampullary carcinoma

Clinical Features	Number	Percentage (%)
Fluctuating jaundice	51	79.7
Palpable gallbladder	49	76.7
Cholangitis	41	64.1
Weight Loss	28	43.8
Palpable liver	24	37.5
Abdominal pain	23	35.9
Anaemia	12	18.8
Recent diabetes mellitus	6	9.4
Abdominal mass	2	3.1

Modified Halsted's resection of Ampullary or Periampullary carcinoma
CBD = Common Bile Duct PD = Pancreatic Duct

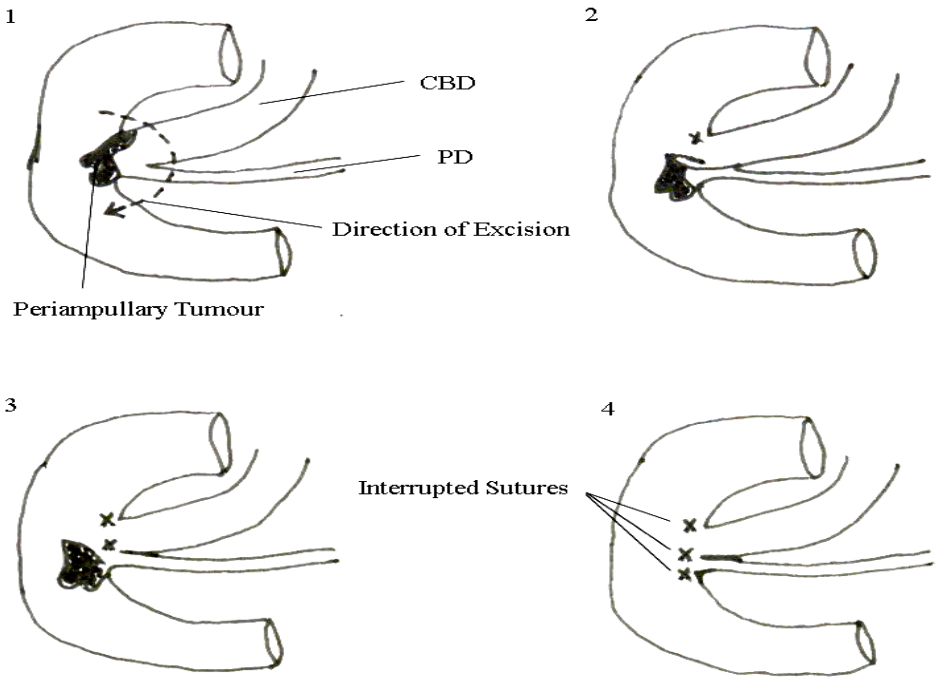

Diagram (1)

The outcome survival range (mean) of the (64 patients) operated upon

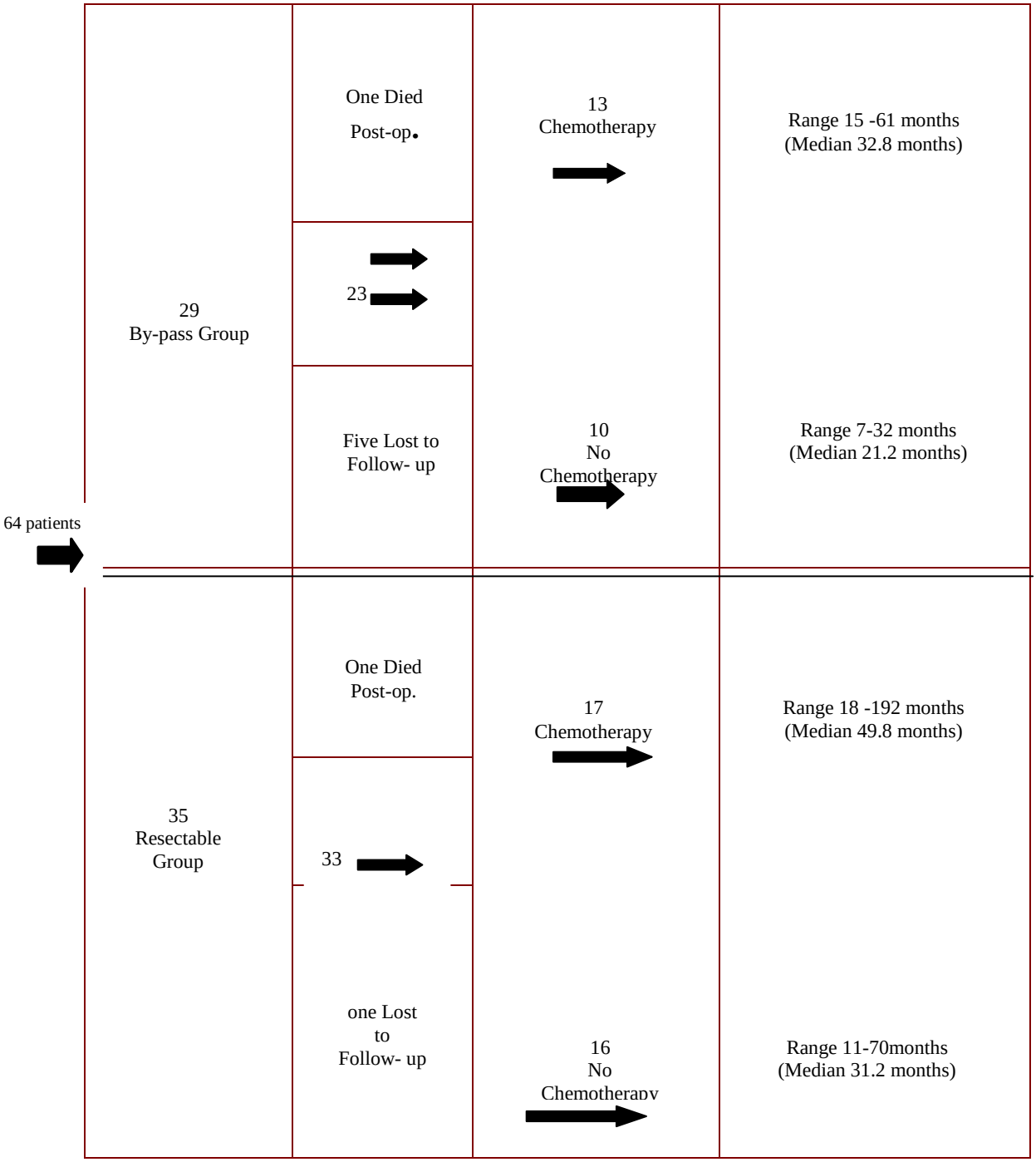
64 patients
29
By-pass Group
One Died
Post-op.
23
Five Lost to
Follow- up
13
Chemotherapy
10
No
Chemotherapy
Range 15 -61 months
(Median 32.8 months)
Range 7-32 months
(Median 21.2 months)
35
Resectable
Group
One Died
Post-op.
33
one Lost
to
Follow- up
17
Chemotherapy
16
No
Chemotherapy
Range 18 -192 months
(Median 49.8 months)
Range 11-70months
(Median 31.2 months)

Diagram (2)

Pre-operative nasobiliary drainage and post-operative T-tube cholangiograms over 10 years following modified Halsted's procedure.
For details, see text.

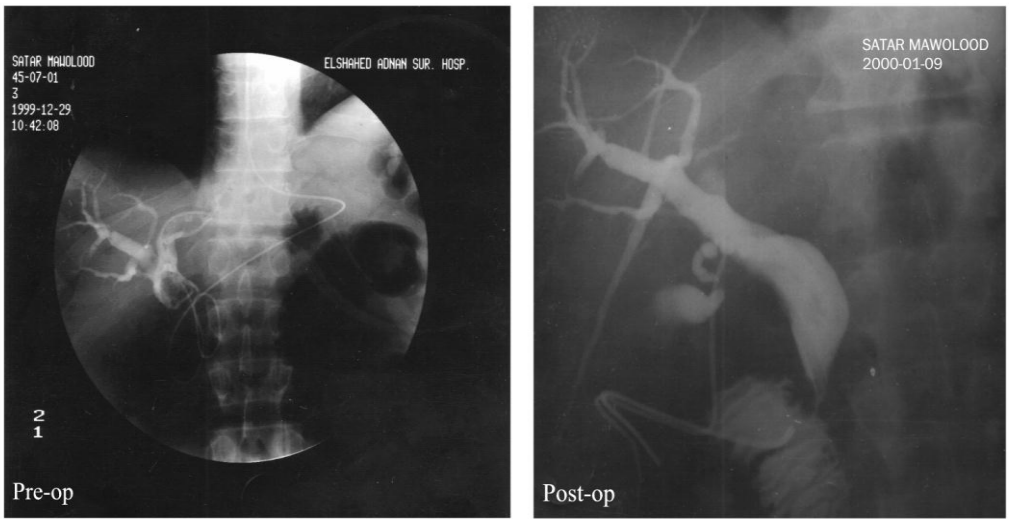

Figure (1) ERCP of a patient six years following resection showing the intra & extra biliary ducts

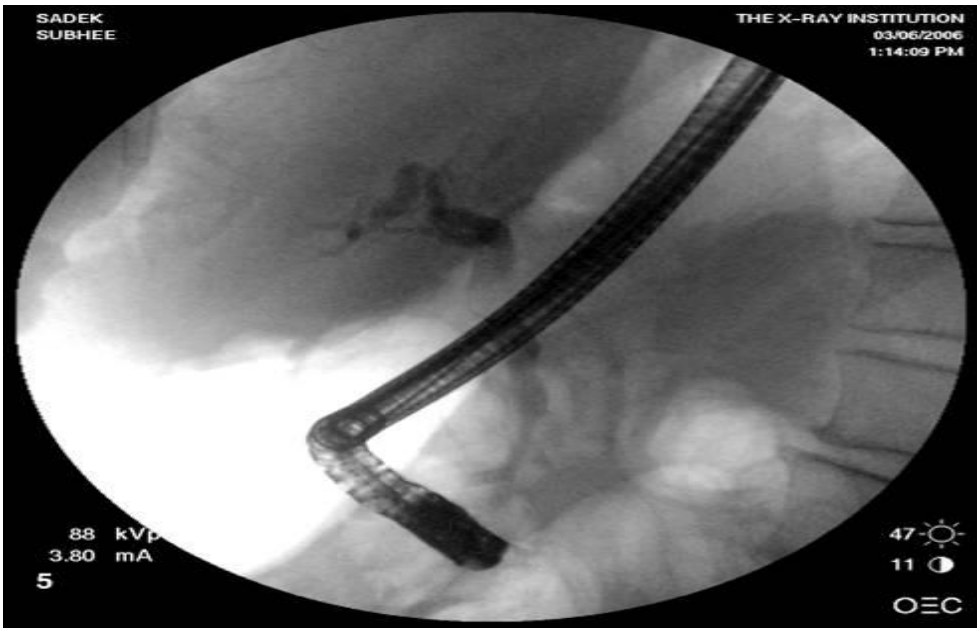

Figure (2)

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