



The results of palliative percutaneous drainage of biliary ducts

Błażej Ciesielczyk, Dawid Murawa

¹Oddział Chirurgiczny Szpitala im. Franciszka Raszei w Poznaniu, ul. Mickiewicza 1, 60-833 Poznań, ²Oddział Chirurgii Onkologicznej Wielkopolskiego Centrum Onkologii w Poznaniu, ul. Garbary 15, 61-866 Poznań

Rep Pract Oncol Radiother 2004;9:69-72, original paper

Received April 1st, 2004; received in a revised form May 15th, 2004; accepted July 8th, 2004

Summary

Background: The aim of palliative treatment of advanced malignant tumours involving the hilus of the liver is to decompress mechanical jaundice. In some cases, percutaneous drainage of biliary ducts is the only possible effective treatment. The aim of this paper is to evaluate the results of palliative percutaneous drainage of biliary ducts.

Materials and methods: Percutaneous drainage of biliary ducts was carried out under ultrasound and x-ray control with a picture channel. A PIGTAIL catheter (9F diameter, 45 cm length) was installed by entering its end-part into intrahepatic biliary ducts and bile diversion. In 5 patients bile was inserted in back to the gastrointestinal tract by simultaneous endoscopic microgastrostomy. In 1996-2003, 52 percutaneous drainages of biliary ducts were installed in 38 patients. All of them suffered from mechanical jaundice with the bilirubin level of 170-510 $\mu\text{mol/l}$ caused by neoplasm constricting biliary ducts. The neoplastic disease in all cases was histologically confirmed. The quality of life was evaluated one month after installing percutaneous drainage of biliary ducts. Regression of symptoms connected with mechanical jaundice, independence and self-service when using a catheter and the physical and mental state of patients were taken into consideration.

Results: In all patients a decrease in the bilirubin level below 170 $\mu\text{mol/l}$ was observed 14 days after the procedure. In 20 patients jaundice regressed completely 4 weeks after the drainage. In a later period increased bilirubin levels were connected with temporary impairment of catheter patency or with infection of biliary ducts. Despite the advanced neoplastic disease patients showed total independence and self-service. However neoplastic cachexia and the necessity to take analgesics deteriorated their quality of life.

Conclusions: 1) Percutaneous drainage of biliary ducts decompresses mechanical jaundice and decreases ailments typical of cholestasis. 2) Percutaneous drainage of biliary ducts requires specialized long-term care and cooperation with the patient and or his or her family. 3) Deterioration in the quality of life in return for its prolongation is accepted by patients and their families.

Key words: percutaneous transhepatic biliary drainage, malignant bile-duct obstruction, interventional ultrasound.

Wyniki paliatywnego przezskórnego drenażu dróg żółciowych

Streszczenie

Wstęp: Celem leczenia paliatywnego zaawansowanych nowotworów złośliwych zajmujących wnękę wątroby jest odbarczenie żółtaczki mechanicznej. W niektórych przypadkach przezskórny drenaż dróg żółciowych jest jedynym skutecznym i możliwym do wykonania zabiegiem. Celem pracy jest ocena wyników paliatywnego przezskórnego drenażu dróg żółciowych.

Materiał i metoda: Przezskórny drenaż dróg żółciowych wykonywano pod kontrolą aparatu usg i rtg z torem wizyjnym. Zakładano cewnik PIGTAIL o średnicy 9F i długości 45cm wprowadzając końcówkę w wewnątrzwątrobowe drogi żółciowe i odprowadzając żółć na zewnątrz. U 5 chorych wprowadzono żółć z powrotem do przewodu pokarmowego poprzez jednocześnie endoskopowo założoną mikrogastrostomię. W latach 1996-2003 założono 52 przezskórne drenaże dróg żółciowych u 38 chorych. Wszyscy chorzy cierpieli na żółtaczkę mechaniczną z poziomem bilirubiny (170-510 $\mu\text{mol/l}$) spowodowaną nowotworem zaciskającym drogi żółciowe. Choroba nowotworowa była u wszystkich leczonych potwierdzona histopatologicznie. Oceniono jakość życia w miesiąc po założeniu przezskórnego drenażu dróg żółciowych uwzględniając ustąpienie dolegliwości związanych z żółtaczką mechaniczną, samodzielność i samoobsługę, także w obsłudze cewnika oraz subiektywny stopień satysfakcji chorych.

Wyniki: U wszystkich chorych wystąpił spadek poziomu bilirubiny poniżej 170 $\mu\text{mol/l}$ po 14 dniach od zabiegu. U 20 chorych żółtaczka ustąpiła całkowicie po 4 tygodniach od drenażu. W późniejszym okresie podwyższenie poziomu bilirubiny związane było z przejściowym upośledzeniem drożności cewnika lub wystąpieniem zakażeń dróg żółciowych. Pacjenci mimo zaawansowanej choroby nowotworowej wykazywali pełną samodzielność i samoobsługę. Jakość życia pogarszało wyniszczenie nowotworowe i konieczność przyjmowania leków przeciwbólowych.

Wnioski: 1) Przezskórny drenaż dróg żółciowych odbarcza żółtaczkę mechaniczną i zmniejsza dolegliwości typowe dla cholestazy. 2) Przezskórny drenaż dróg żółciowych wymaga długotrwałej opieki specjalistycznej oraz współpracy z chorym lub jego rodziną. 3) Pogorszenie jakości życia celem jego przedłużenia jest akceptowane przez pacjentów i ich rodziny.

Słowa kluczowe: przezskórny drenaż dróg żółciowych, zwężenie nowotworowe dróg żółciowych, ultrasonografia zabiegowa.

Introduction

Carcinomas of the liver, bile ducts or the pancreas by growing close the lumen of bile ducts lead to intrahepatic cholestasis and, eventually, to jaundice. It is a life threatening condition and if left untreated in a short time causes hepatic coma and death. The purpose of implementing mechanical jaundice treatment is to restore bile ducts patency. This can be achieved by a complete or partial resection of the tumour, a bypass anastomosis [1,2,3], internal [4] or external drainage [5,6,7]. Sometimes drainage is introduced prior to a resection to resolve jaundice and to improve the general condition of the patient. One of the methods of external drainage is transdermal bile ducts drainage (tbdd) performed under ultrasound and X-ray monitoring using a vision line (Figure 1). The procedure brings about a decrease in blood bilirubin [6,8] as well as improvement in life quality by relieving symptoms associated with jaundice (pruritus, sitophobia) [9]. After a successful tbdd in patients with inoperable hepatic, pancreatic or bile ducts carcinomas palliative surgery becomes redundant [1,8]. Tbdd prolongs life - taking into account high perioperative mortality in this group of patients - and reduces treatment costs. A drawback of this method is a large number of early and late complications and the necessity to supply bile to the alimentary tract [9,10]. This may result in patient's not accepting the treatment.

The aim of the paper is to evaluate the effects of palliative tbdd.



Figure 1. Patient M.L. age 78. Percutaneous drainage of biliary ducts was carried out on account of inoperable neoplasm of biliary tract.

Material and methods

In the years 1996-2003 fifty two tbdd procedures were performed in 38 patients who could not undergo bypass anastomoses or endoscopic bile ducts prosthesis. The group investigated involved 20 females and 18 males. In 11 patients the drainage was done twice, in one patient it was

carried out - three times. The causes of mechanical jaundice were: 1) gall bladder or bile ducts carcinoma in 24 patients, 2) pancreatic carcinoma in 9 patients, 3) gastric carcinoma in three patients, and, 4) hepatic carcinoma in two patients. All patients had their neoplastic diseases confirmed on histopathological examination during: 1) previously done laparotomy, 2) fine needle or endoscopic biopsy, or 3) on a cytological examination of the hydroperitoneal fluid. All patients suffered from mechanical jaundice with bilirubin levels of 170-510 $\mu\text{mol/l}$.

Drains were inserted by a Seldinger's method from anterior or antero-lateral approach under combined US and X-ray monitoring. A 45 cm long PIGTAIL catheter of 9F diameter was introduced with its tip inserted into intrahepatic bile ducts, draining bile outside. The drainage technique was presented in a separate report [10]. Patients were re-punctured due to losing the catheter (8 cases), unsuccessful attempt to change the catheter (4), or faulty primary drain insertion (1). In 5 patients bile was re-introduced back to the alimentary canal by a simultaneously endoscopically performed microgastrostomy.

On the 14th and 30th day following the insertion of the catheter, bilirubin, alkaline phosphatase, urea and Na, K and Cl electrolytes levels were controlled. Patients were discharged home approx. on the 8th day after the procedure, but were still followed-up by the hospital out-patient department. One month after the tbdd insertion patients' quality of life was evaluated taking into consideration relief in symptoms typical of mechanical jaundice, patients' independence and daily self-service - including drain servicing and a subjective level of satisfaction.

Results

After 14 days following the procedure a fall in bilirubin level below 170 $\mu\text{mol/l}$ was noted. On the 30th day after tbdd, jaundice disappeared completely in 20 patients (52,6%) and persisted at the bilirubine levels of 85 $\mu\text{mol/l}$ in 9 patients (23,7%); temporary increase in bilirubine level was observed in one patient, four patients died of neoplastic cachexia, four patients did not recall for the follow-up. At a later period an increase in bilirubin levels was due to the catheter impatency or bile ducts infections. This was resolved by restoring or exchange of the catheter and by fighting infections. A drop in alkaline phosphatase was observed, but only in two patients (5,3%) it came back to normal. In 16 patients (42,1%) uraemia with hypokaliemia occurred. No electrolyte disorders were noted.

Quality of life was evaluated one month after tbdd in 30 patients.

Pruritus subsided in all patients. In 26 patients (86,7%) better appetite and regression of nausea was observed. All patients returned home and did not require round-the-clock help; one patient returned to work. Twenty four (80%) patients were successful with the catheter and a bile

pouch self-service, the remaining 6 elderly patients or with a marked cachexia required third party assistance.

Complaints reported on the 30th day after tbdd were: weakness (14 persons), pains (6), skin inflammation around the drain insertion (10), transient bile leak along the drain (11), leak of gastric contents after microgastrostomy (1), and pains and skin inflammation in the perimicrogastrostomy area (5). None of the patients who were recommended to drink bile reported any associated complaints. With the disease progress impaired independence and self-service was observed.

The implemented treatment was fully accepted by 16 patients (53.3%) and partly by 8 (26.7%); other two patients (6.7%) accepted it but also resorted to other therapeutic means; it was not accepted by other 4 patients (13.4), still they did not demand catheter removal. The degree of acceptance depended on the quality of pre-operative information and was higher in patients informed about the prognosis. The families showed full consent for the treatment.

Discussion

Tbdd prolongs life of the incurably ill [11,12,13,14], but is burdened with a large number of complications and inconveniences in further treatment [9,15] causing doubts if its benefits override its drawbacks. Bypass anastomosis and endoscopic bile ducts prosthesis have an undoubted advantage of not requiring bile supply to the alimentary canal [15], and self reinflating metallic prostheses retain patency for a long time and are by many considered management of choice [16,17,18]. In the case of a narrowed a bile duct proximal segment, when other palliative methods have failed or are inapplicable, the only method to fight cholestasis is tbdd [5]. Relieving bile ducts tension with subsequent bile supply to the alimentary tract causes immediate improvement in the patient's general condition. Obviously, it is a temporary situation and most commonly a short-term one, still completely accepted by patients informed about the essence of their ailment and helped by a psychologist's support. Because of an occasional blockage of the catheter and transient bile ducts inflammations patients should remain under constant care of a specialist outpatient clinic attached to the medical centre where tbdd was performed [10]. However, it needs to be remembered that the aim of palliative treatment is to enable patients to return home and not to sentence them to prolonged stay in terminal care centres. Therefore, cooperation with the family as well as training patients and their families in proper management of drains is necessary as in the terminal stage of the neoplastic disease patient's independence and self-service becomes reduced.

Microgastrostomy seemed a perfect means to avoid inconvenience of drinking bile, unfortunately, it causes skin inflammation around drain insertion, lack of drained bile

amount monitoring, and gastric mucosa inflammation. It can be applied especially in patients who do not accept bile drinking, however it requires further experiments to improve it and, consequently, to reduce the incidence of resulting complications.

Conclusions

1. Transdermal bile ducts drainage eases mechanical jaundice and reduces symptoms typical of cholestasis
2. Tbdd requires long-term specialist care and cooperation with patients and their families
3. Deterioration in life quality but prolongation of its span is accepted by patients and their families.

References

1. Buckwalter JA, Tudrick KT. Bypass operations for neoplastic biliary tract obstruction. *Am J Surg* 1985;109:100-106.
2. Knast W, Markocka-Mączka K. Zespolenie omijające w nieoperacyjnych guzach okolicy okołobańkowej. *Pol Przegl Chir.* 2000;72:1071-73.
3. Rutkowski P, Nyckowski P, Krawczyk M. Wewnątrzwątrobowe zespolenie przewodowo-jelitowe w nieresekcyjnych nowotworach wnęki wątroby. *Pol Przegl Chir.* 2001;73:269-76.
4. Swanstrom LL. Endoscopic surgery for pancreaticobiliary cancer. *Surg Endosc.* 1998;12:370-71.
5. Clements WDB, Diamond T, Mc Crory DC, Rowlands BJ. Biliary drainage in obstructive jaundice: experimental and clinical aspects. *Br J Surg.* 1993;80:834-42.
6. Ferruci JT, Mueller PR, Harwim WP. Percutaneous transhepatic biliary drainage. *Radiology* 1980;135: 1-13.
7. Olakowski M, Lampe P, Rabat J, Słota J, Grabarczyk A, Olakowska E. Zmodyfikowany drenaż Kehra w nieresekcyjnych guzach powodujących żółtaczkę mechaniczną. *Pol Przegląd Chir* 2000;72:1036-48.
8. Hellekant C, Jonsson K, Gerll S. Percutaneous internal drainage in obstructive jaundice: experimental and clinical aspects. *Br J Surg* 1993;80:834-42.
9. Karasek M, Garcarek J, Jarnicki K, Szyber P. Powikłania po przeszskórnym drenażu dróg żółciowych. *Pol Przegl Radiol* 1997;62:187-89.
10. Ciesielczyk B, Skommer M. Algorytm postępowania po przeszskórnym drenażu dróg żółciowych. *Pol Przegl Chir* 2002;713-721.
11. Ferrucci JT. Interventional radiology of the biliary tract. *Gastroenterology* 1983;82:974-985.
12. Pruszyński B, Kalinowski R. Przeszkórny, zewnętrzny drenaż żółci w przebiegu żółtaczki mechanicznej. Technika, wskazania i znaczenie kliniczne. *Pol Przegl Radiol* 1984;48:93-97.
13. Gazzaniga GM, Faggioni A, Bondanzi G, Bagardo C, Filairo M. Percutaneous transhepatic biliary drainage – twelve years experience. *Hepatogastroenterology* 1991;38:154-59.

14. Malangoni MA, Mc Coy M, Richardson JD, Flint LM. Effective palliation of malignant biliary duct obstruction. *Ann Surg* 1985;201:554-59.
15. Speer A, Cotton P, Russel R, Mason R, Hatfield A, Leung J et al. Randomised trial of endoscopic versus percutaneous stent insertion in malignant obstructive jaundice. *Lancet* 1987;11:57-66.
16. Davids P, Groen A, Rauws E, Tygat G, Huibregtse K. Randomised trial of self-expanding metal stents versus polyethylene stents for distal malignant biliary obstruction. *Lancet* 1992;340:1488-492.
17. Schofl R, Brownstone E, Reichel W, Fortunat W, Doblhofer F, Samec H, et al. Malignant bile-duct obstruction: experience with self-expanding metal endoprotheses in Austria. *Endoscopy* 1994;26:592-96.
18. Smits M, Huibregtse K, Tygat G. Results of the new Nitinol self-expandable stents for distal biliary strictures. *Endoscopy* 1995;27:505-8.