Long-term survival for 13 years after percutaneous transhepatic cholangioscopic microwave tissue coagulation (MTC) in an inoperable jaundiced woman with bile duct carcinoma

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Abstract

We report a patient with bile duct carcinoma with longer than 13-year survival with no surgical treatment but cholangioscopic MTC. A 67-year-old female who had undergone coronary arterial bypass grafting was referred to our institution because of increased obstructive jaundice with bile duct carcinoma. Because she had undergone the coronary bypass operation using pedicle right gastroepiploic artery, it was not possible to apply pancreatectoduodenectomy as radical operation. Therefore, percutaneous transhepatic cholangioscopic and X-ray image-guided MTC using Microtaze® (Heiwa Electronic Industrial Co., Ltd., Osaka, Japan) and 1.8 mm spherical, 5 mm bullet-shaped antennas was carried out under radiation of 45 watts and repetitions of 3-5 second duration. Serial cholangioscopic examination was conducted once a month for 3 years and sometimes disclosed involvements which were biopsied and shown to be recurrences histologically and followed by retreatment using MTC. The patient has been alive for more than 13 years since onset of jaundice, and is 81 years old. No adverse side effects were noted.

Our method uses not only coagulation but also a mild hyperthermic condition with a 5 mm antenna on the tumor margin at the depth of invasion as well as on the ductal lumen. MTC may be useful for palliation of inoperable patients with bile duct carcinoma, and sometimes for cure of the patients in the early stage of progression.

Key words: bile duct carcinoma, MTC (microwave tissue coagulation), long-survival, inoperable

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Introduction

Bile duct carcinoma is one of the most lethal and aggressive malignancies, with the majority of patients harboring unresectable tumors at presentation.

The current conventional treatment for bile duct carcinoma is either bile duct resection with hepatectomy or pancreatoduodenectomy based on its location according to the guidelines for diagnosis and treatment of bile duct carcinomas\(^1\). However, there has been no expectation of long-term survival of more than 5 years without resection for a jaundiced patient with bile duct carcinoma.

We report a patient with bile duct carcinoma with longer than 13-year survival with no surgical treatment but cholangioscopic MTC. Although cholangioscopic MTC is a palliative procedure for bile duct carcinoma, it could be an alternative means of non-operative management of highly risky patients with bile duct carcinoma.

Case

A 67-year-old female who had undergone coronary arterial bypass grafting (CABG) was referred to our institution because of increased obstructive jaundice with suspected bile duct carcinoma. Percutaneous transhepatic cholangial drainage (PTCD) was conducted for biliary decompression and improvement of her jaundice, followed by detection of a fluorographic filling defect in the middle and lower bile duct, which suggested complete obstruction (Fig. 1).

Computed tomography (CT) and ultrasonography (US) examinations revealed no metastatic regional lymph node involvement.

Employing step-wise dilatation of the PTCD sinus tract, percutaneous transhepatic cholangioscopy (PTCS) revealed a papillary tumor in the common bile duct (CBD), which resulted in the histological diagnosis of papillary adenocarcinoma (Fig. 2).

Because she had undergone CABG using pedicle right gastroepiploic artery, it was not possible to apply pancreatoduodenectomy as radical operation.

Therefore, cholangioscopic and X-ray image-guided MTC using Microtaze\(^2\) (Heiwa Electronic Industrial Co. Ltd., Osaka, Japan) and 1.8 mm φ spherical, 5 mm φ bullet-shaped antennas was carried out under radiation of 45 watts and repetitions of 3-5 second duration (Fig. 3). After complete re-canalization of the CBD and lack of malignant lesions on biopsy, an indwelling tube (16 Fr, Create Medic Co. Ltd., Kanagawa, Japan) was left in place in the sinus tract for the
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Cholangioscopic examination was conducted once a month for 3 years and sometimes disclosed involvements which were biopsied and shown to be recurrences histologically and followed by re-treatment using MTC.

Two years later (5 years from the initial MTC), the indwelling tube was removed without any findings of recurrence. The patient has been alive for more than 13 years since onset of jaundice, and is 81 years old. No adverse side effects were noted.

Discussion

A long post operative course of more than 10 years without recurrence has not generally been expected for patients with bile duct carcinoma suffering from obstructive jaundice. Furthermore, patients with bile duct carcinoma not undergoing operation or resection are expected to survive for no more than a few months.

We have presented a case of obstructive jaundice with bile duct carcinoma with no surgical treatment but cholangioscopic MTC with long survival of more than 10 years.

Recently, non surgical endoscopic procedure such as endoscopic mucosal resection (EMR) and endoscopic mucosal dissection (ESD) have featured remarkable progress in the treatment of early-stage gastrointestinal tract (gastric and colon) carcinoma. Notably, this progress has been supported by study of the correlation between the pathological findings of endoscopically resected specimens (depth of invasion, margin of resection) and prognostic factors (rate of recurrence, survival). Moreover, endoscopic treatment of gastrointestinal tract cancer has also been accepted because it provides an outcome comparable to that of surgical procedure.

For malignant neoplasms in the bile duct, however, it is difficult or impossible to perform feedback study because sufficient amount of specimens cannot be obtained non-surgically due to the anatomical problem (small and complicated) and due to the problem of approaching technique [PTCS or endoscopic retrograde cholangioscopy (ERC)], so we can obtain little information about correlation between histopathological findings and prognosis. Therefore, instead of attempt-
ing to obtain specimens from the small area, such methods as obtaining cholangioscopic (optical) superficial information on the mucosal surface in detail, which suggests the margin of spread of carcinoma, and information concerning depth of invasion by endoscopic ultrasonography (EUS) and/or CT have been under investigation. This will be much more helpful in performing non-surgical treatment of inoperable patients with bile duct neoplasms.

Apparently, MTC is superior in utility (operability and portability, inexpensiveness, and safety) to such other methods as remote afterloading systems (RALS, that is, irradiation therapy), light amplification by stimulated emission of radiation (LASER), and the electric scalpel. Despite use of irrigation fluid (physiological saline), there is less possibility of electrical conduction injury in MTC than with the electric scalpel method. Moreover, our method uses not only coagulation but also a mild hyperthermic condition with a 5 mm $\phi$ antenna on the tumor margin at the depth of invasion $^5$ as well as on the ductal lumen $^6$.

Accurate and real-time visualization of thermal distribution is most important for effective MTC treatment. Open-top magnetic resonance imaging (MRI) which provides real-time thermal views with no electromagnetic image disturbances by microwave, will be a useful and supportive tool for performing MTC of neoplasms in the bile duct $^6$.

No adverse effects of MTC were noted in this patient. Major side effects of this treatment such as ductal perforation and vessel injury do not occur in mild MTC treatment but may occur in the sinus-tract-making and dilating interventions of PTCD and PTCS. Careful and gentle maneuvers utilizing an advanced US system, which can discriminate the sinus tract, bile duct, and blood vessels precisely, will be able to achieve intervention with less invasion.

Initially, MTC was used as palliative, symptomatic treatment for patients with bile duct neoplasms with obstructive jaundice, and in a female patient, MTC was performed safely, achieving a long survival of more than 10 years. MTC may be useful for palliation of inoperable patients with bile duct carcinoma, and sometimes for cure of the patients in the early stage of progression.

References