MEGA JOURNAL OF CASE REPORTS

OPEN ACCESS

Comprehensive Review

Compiled Date: February 26, 2024

An Idea of Management of Long Term Post Surgical Biliary Leakage Treated with External Drainage and Finally with NBCA Embolization

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Abstract

Introduction: Bile leaks can be a complication of abdominal surgeries. Their management involves a multidisciplinary approach and depends on a multitude of factors. We will discuss a case of biliary leakage after metastasectomy.

Case presentation: A 60-year-old male patient visits the emergency room for abdominal pain and other symptoms such as change of intestinal habits (alternating diarrhea-constipation) and rectal bleeding. CT abdomen without and with intravenous contrast reveals a distal colon mass with lymphadenopathy and liver metastasis. After neoadjuvant chemiotherapy the CT control shows a reduction of the neoplastic mass and of the liver metastasis. So, the patient is treated by surgical resection of the tumor and of the metastasis and as a complication of liver surgery there is the evidence of a bile collection (caused by the presence of post-surgical fistula, as colangio-RM shows) that increased after 3 months from the metastasectomy. After interventistic consult, the medical equipe decide to manage the collection by a percutaneous drainage. However, due to the persistence of biliary leakage that constantly supplies the collection, there is a second time approach with a treatment of embolization of the bile duct, identified as the cause of the supply by injection of mdc during CTCB. After 6 mouths from the embolization the CT control shows the complete resolution of the leakage.

Conclusion: Our experience shows that embolization of biliary leakage with N-butyl cyanoacrylate, one of the materials studied as potential sealants of biliary tract, gives excellent results to resolve bile ducts injury.

Keywords: Biliary leakage; Biliary drainage; N-butyl cyanoacrylate; Transhepatic embolization

Introduction

Bile leaks can be a complication of abdominal surgeries. Their management involves a multidisciplinary approach. There is no official guideline algorithm for the treatment of bile leaks. We describe a case of biliary leakage after liver metastasectomy in a 60-year-old man managed by a first approach by drainage and a second resolutive approach by embolization with NCBA.

Case Presentation

A 60-year-old male patient with sigmoid carcinoma and liver metastasis did neoadjuvant chemotherapy followed by colectomy and hepatic metastasectomy with right hepatic lobectomy. The CT control showed the presence of fluid-corpuscular collection close to the resection area, which increased at subsequent controls **(Figure 1)**. In suspect of bile duct injury Cholangio-MR with epatospecific contrast was performed and it revealed biliary leakage and fistula with spreading of contrast close to surgical margins **(Figure 2 and 3)**. US-guided percutaneous drainage was placed. After disinfection under US-guidance the hepatic collection was achieved with an 18 G cannula; 10 cc of material was aspired in order to do a cultural examination. An 8 Fr pigtail drainage was placed on stiff guide 0.035 under US-guidance without peri- and post-procedural complications. After 7 days, CT control showed the correct placement of pigtail and the reduction of collection but not its resolution. After 4 weeks a biliary stent was placed to improve bile outflow and reduce the intraductal pressure, in order to create a depression within the VBP, which facilitated the closure of the fistula **(Figure 4 and 5)**. Due to the high-output external biliary fistulas (> 300 ml per day) and the persistence of the biliary leakage, the embolization of the fistula was performed. Preliminary CBCT with contrast injection by the drainage showed the point of biliary leakage. After disinfection under fluoroscopic guidance the fistula was achieved and 0.5cc of a bland of Glubran diluted with Lipiodol (1:3) was injected **(Figure 6 and 7)**. The CBCT control showed the good procedural outcome without peri- and post-procedural complications **(Figure 8)**. The patient returned home in good clinical conditions and after 6 months CT control shows the efficacy of treatment.

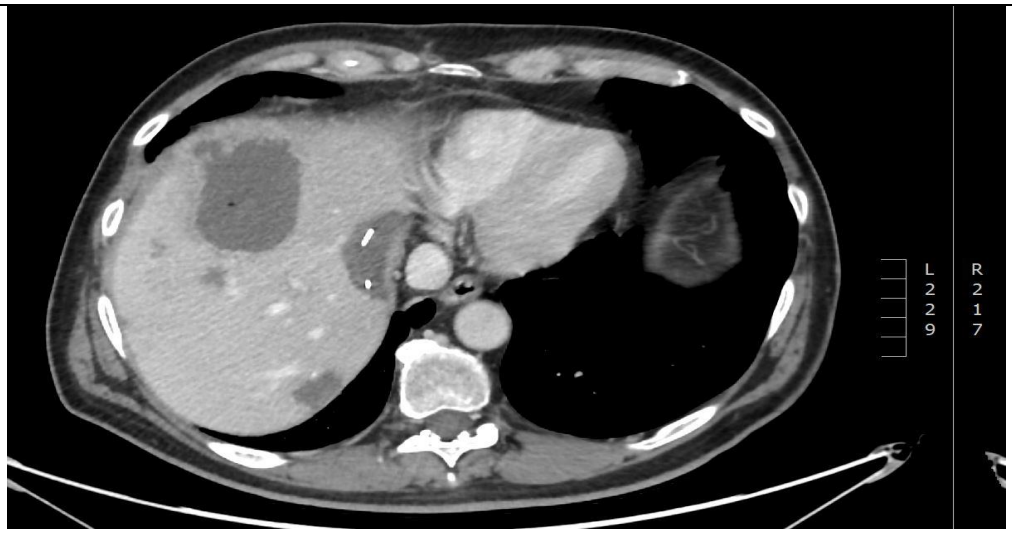

Figure 1: CT control after surgery shows the presence of fluid-corpuscular collection close to the resection area.

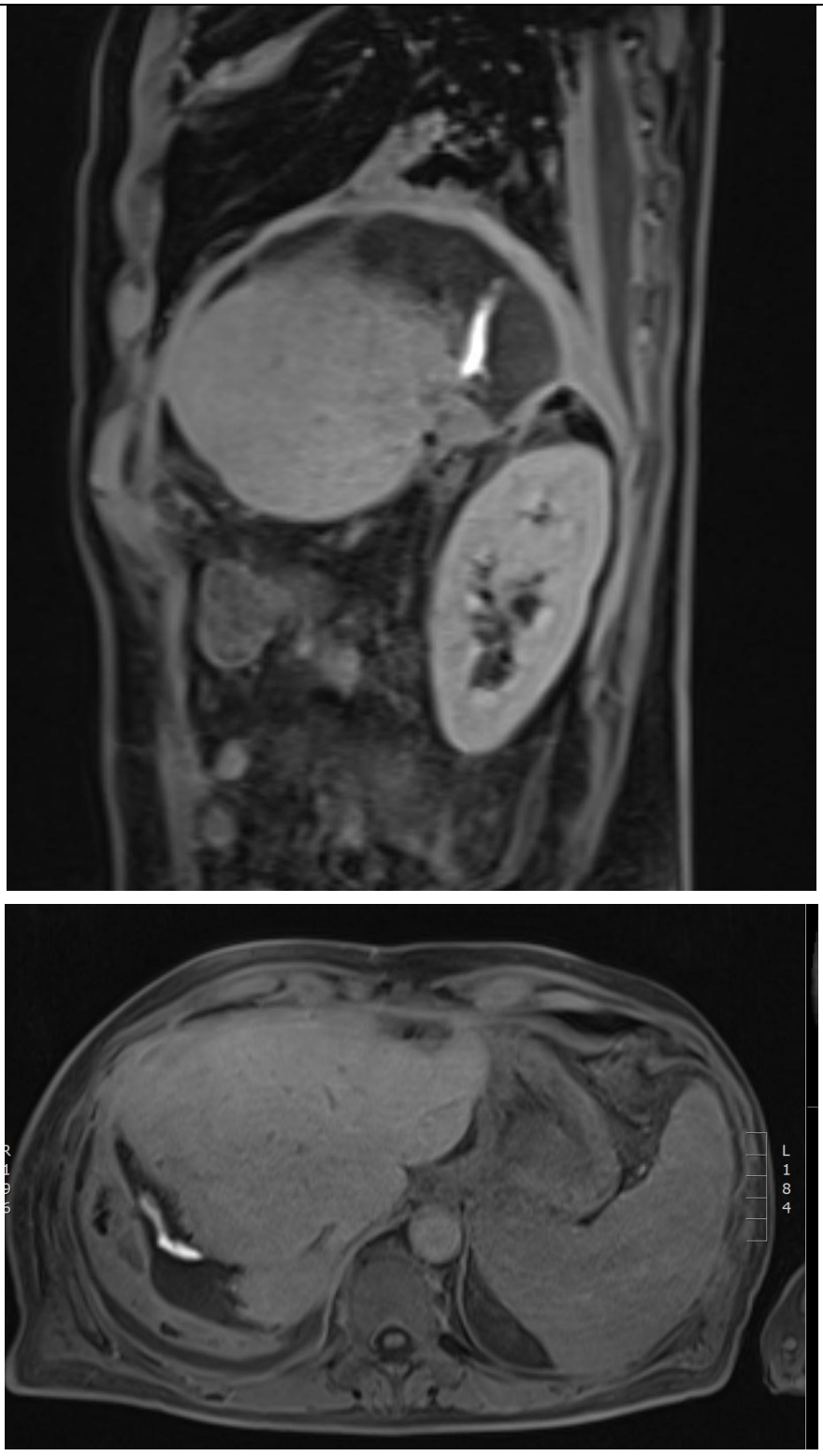

Figure 2 and 3: Cholangio- MRI sagittal fat sat (2) and axial fat sat (3) T1w with epatospecific contrast show biliary leakage and fistula with spreading of contrast close to surgical margins.

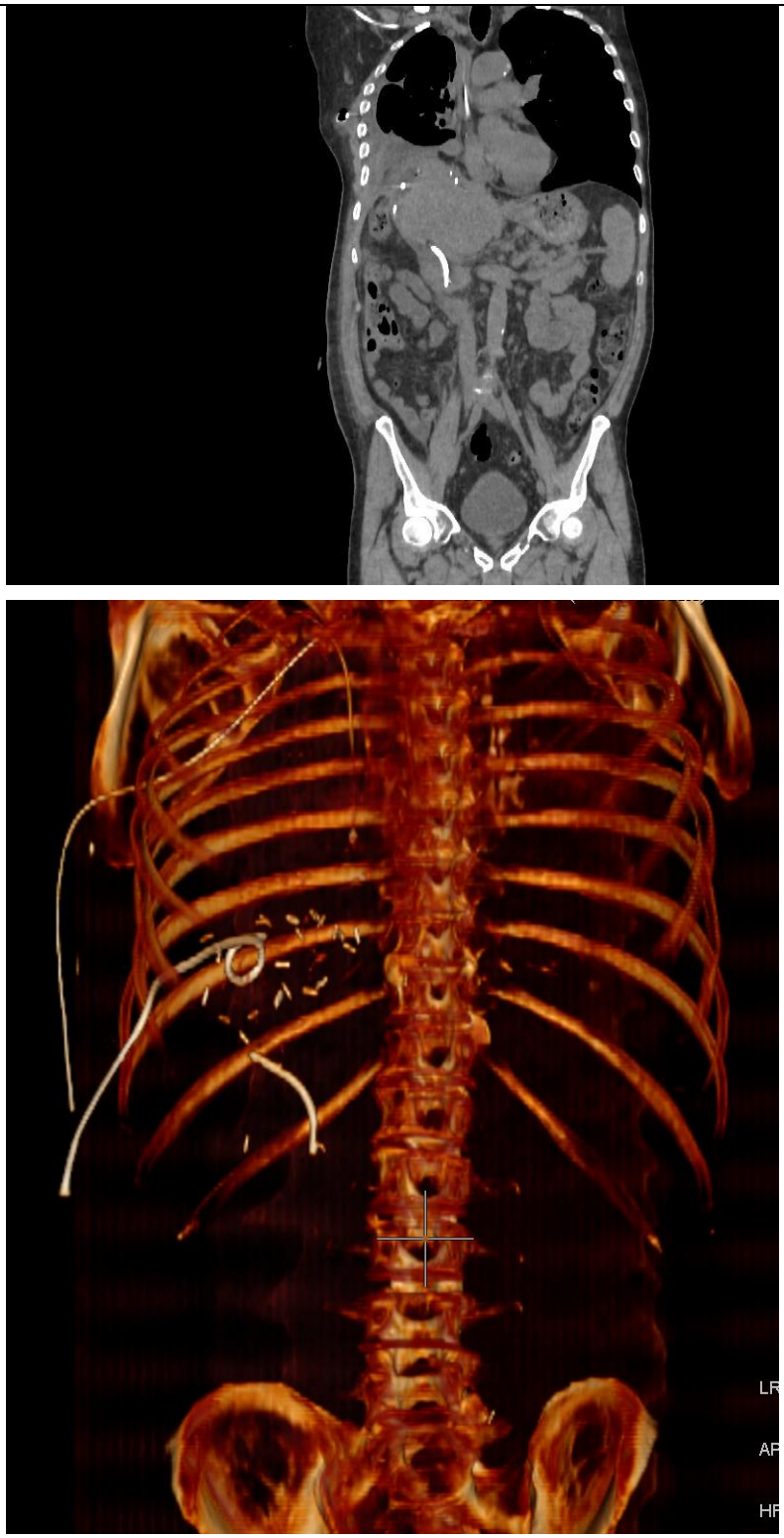

Figure 4 and 5: CT coronal and CT volume rendering images show biliary stent, placed to improve bile outflow and facilitate the closure of the fistula.

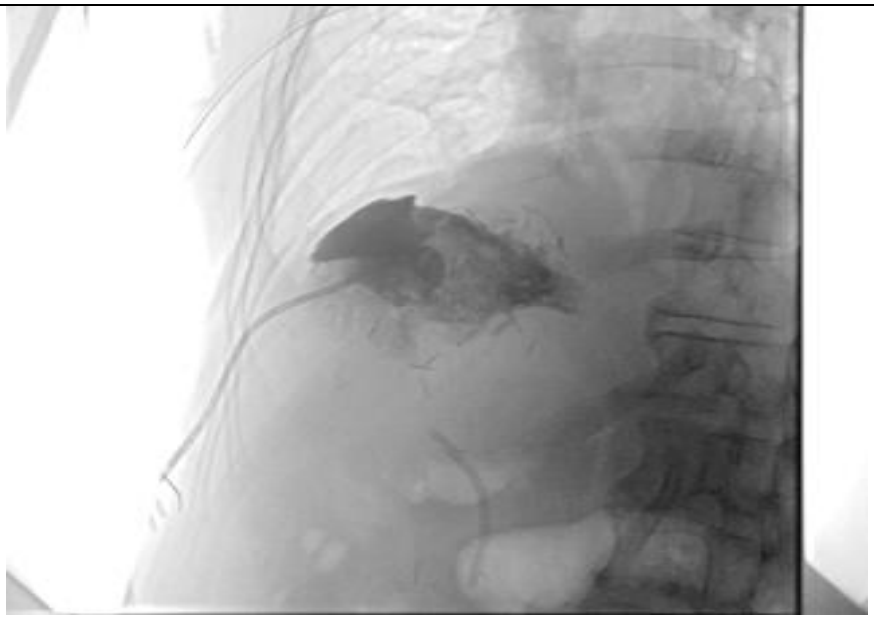

Figure 6 and 7: fluoroscopic image pre-embolization (6) shows the fistula; fluoroscopic image post embolization (7) shows the evidence of treatment with the injection bland of Glubran diluted with Lipiodol (1:3).

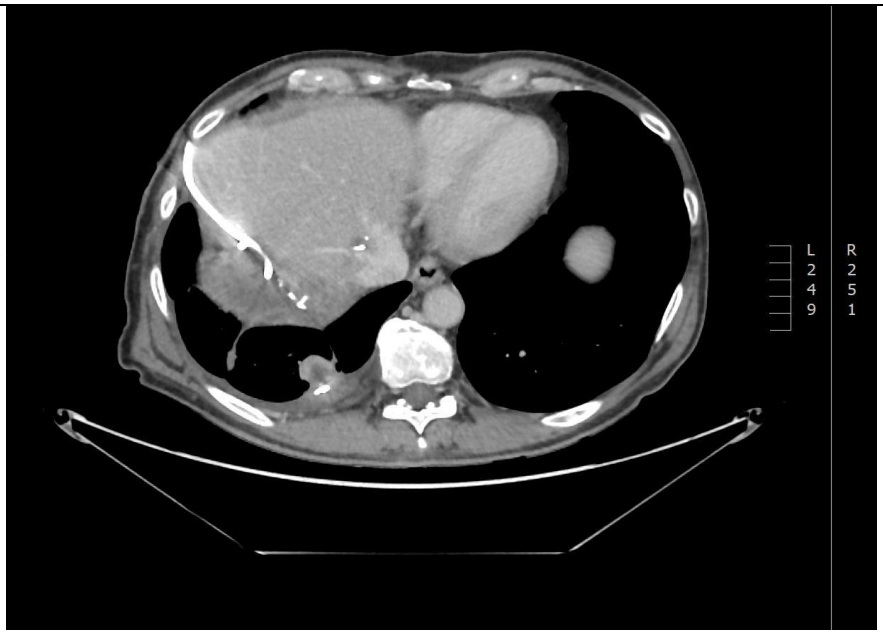

Figure 8: CT control 6 months after embolization shows the efficacy of treatment.

Discussion

Bile Duct Injuries (BDI) associated to biliary leakage represent one of the most frequent complications of abdominal surgery, they mainly may be due to pancreatic and liver surgery [1]. Common bile duct injuries are identified by specific procedure codes, such as ICD-9 and CPT, for patients who subsequently undergo hepatectomy or other bile duct surgery [2]. They can cause different and severe complications: bile peritonitis due to the formation of bile collections, external biliary fistulas, jaundice, cirrhosis and portal hypertension. All these conditions can be very dangerous due to the possibility of evolution into a septic shock and death of the patient [3,4], especially if not recognized promptly. Different studies highlighted that a first approach and immediate surgical repair of bile duct represents a valid instrument only for experienced surgeons. On the contrary, if it is performed in the second level center for hepatobiliary surgery, it can lead to worse complications that could have a strong impact on the life quality of the patients. However, a first approach by drainage of the site and the secondary surgical treatment into a specialized hepatobiliary center seems to be the best way to guarantee the resolution of an iatrogenic lesion [5]. The management of bile duct injuries involves a multidisciplinary approach. Nowadays, there is no official guideline algorithm for the treatment of bile leaks [6]. The first classification of bile duct injury is authored by H. Bismuth in 1982. The Bismuth classification included five types of bile duct injuries according to the distance from the hilar structure, the level of injury and the extent of ductal infiltration: the involvement of common hepatic duct, bile duct bifurcation and right sectoral duct. Type I includes the common bile duct and low common hepatic duct below the level of the confluence of the right and left hepatic ducts (CHD >2 cm from the hepatic duct confluence). Type II involves the proximal Common Hepatic Duct (CHD <2 cm from the confluence). Type III is hilar injury with no residual CHD confluence intact. Type IV involves the origins of both right and left hepatic ducts, it is destruction of the confluence when the right and left hepatic ducts become separate (multifocal involvement). Type V involves the aberrant right sectoral hepatic duct alone or with concomitant injury of common hepatic duct. For simple low flow bile fistulas (type I or II) it's possible to drain the bile of the entire liver by placing biliary stents in the VBP. In case of major biliary fistulas (type III, IV or V), however, if recognized immediately they must be treated with a biliary-biliary or biliary-digestive anastomosis. In case

of evidence in the post-surgical follow-up, they should be treated with reconstruction using hepaticojejunostomy on a Roux-en-Y loop. These surgeries, however, are burdened by a significant incidence of complications and mortality, even if performed by surgeons with great experience. The diagnostic workup starts with laboratory evaluation: serum lab profile includes complete blood count and liver function tests (high level of bilirubin, serum alkaline phosphatase, and gamma-glutamyl transferase can often be associated with leukocytosis). Then it's necessary to identify the anatomical site of the BDI and to confirm positioning by diagnostic imaging, before treating the ductal structure. Transabdominal ultrasound it's helpful to determine the presence of a fluid collection; CT, Magnetic Resonance Cholangiopancreatography (MRCP) and Endoscopic Retrograde Cholangiopancreatography (ERCP) are useful to determine the source of the leak **[6]**. To manage bile duct injuries there are three main materials that have been studied as sealants of the biliary leak: fibrin, ethanol, and N-Butyl Cyanoacrylate (NBCA) **[7]**. NCBA glue is a medical device (a low-viscosity monomer) used in traditional surgery treatments to suture surgical or traumatic wounds and in to implant vascular devices during the management of Arteriovenous Malformations (AVMs) or in conditions involving arteriovenous shunting. When in contact with organic fluids (blood, bile, etc.), this substance undergoes rapid polymerization and solidification and provides a permanent embolization and a long-term occlusion in vessels of biliary ducts **[8-10]**. The use of NBCA glue in obliteration of bile ducts is a fast and safe procedure with excellent results in patients with complications from isolated segmental ducts. This kind of treatment can decrease the morbidity associated with chronic external biliary drainage **[11]**.

Conclusion

Our experience shows that embolization of biliary leakage with N-butyl cyanoacrylate, one of the materials studied as potential sealants of biliary tract, gives excellent results to resolve bile ducts injury. We can conclude that this treatment is feasible, safe, effective and less invasive than surgery, to manage all those patients that have high comorbidities and comorbilities. It should be considered also in case of major biliary fistulas (type III, IV or V), because the surgical treatments are burdened by a significant incidence of complications and mortality, even if performed by surgeons with great experience.

References

1. Ahmed M. Acute cholangitis - an update. World J Gastrointest Pathophysiol. 2018;9(1):1-7.
2. Halbert C, Pagkratis S, Yang J, et al. Beyond the learning curve: incidence of bile duct injuries following laparoscopic cholecystectomy normalize to open in the modern era. Surg Endosc. 2016;30(6):2239-43.
3. Barrett M, Asbun HJ, Chien HL, et al. Bile duct injury and morbidity following cholecystectomy: a need for improvement. Surg Endosc. 2018;32(4):1683-8.
4. Sharma M, Singh R, Singh NR. Management of iatrogenic bile duct injury in cholecystectomy: a single centre experience. Int Surg J. 2017;4(1):29-34.
5. Sbuelz F, Oppici D, Scotti A, Berardi G, Gugliemo N, Colasanti M, Levi Sandri GB, Ettorre GM. Bile duct injuries management: the experience of a high volume liver surgery centre. Dig Med Res. 2020;3:37.
6. Gawlik C, Carneval M. A Review of the Management of Bile Leaks. Cureus. 2021;13(5):e14937.
7. Caffariello G, Ierardi AM, Piacentino F, Larissa NC. Percutaneous transhepatic embolization of biliary leakage with N-butyl cyanoacrylate. Indian J Radiol Imaging. 2012; 22(1):19-22.

8. Vu DN, Strub WM, Nguyen PM. Biliary duct ablation with n-butyl cyanoacrylate. J Vasc Interv Radiol. 2006;17(1):63-9.
9. Lauterio A, Slim A, Aseni P, Giacomoni A, Di Sandro S, Corso R, et al. Percutaneous transhepatic bile duct ablation with n-butyl cyanoacrylate in the treatment of a biliary complication after split liver transplantation. J Transplant. 2009;2009:824803.
10. Seewald S, Groth S, Sriram PV, Xikun H, Akaraviputh T, Mendoza G, et al. Endoscopic treatment of biliary leakage with n-butyl-2 cyanoacrylate. Gastrointest Endosc. 2002;56(6):916-9.
11. Doan N. Vu, William M. Strub, Pho M. Nguyen. Biliary duct ablation with N-butyl cyanoacrylate. Copyright © 2006 Society of Interventional Radiology. Published by Elsevier Inc. All rights reserved.

Citation of this Article

Brignola N, Federico E, Caterina V, Gaetano S, Luca T, Salvatore S and Francesco F. An Idea of Management of Long Term Post Surgical Biliary Leakage Treated with External Drainage and Finally with NBCA Embolization. Mega J Case Rep. 2024;7(2):2001-2008.

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