

Hepatic Arterial Infusion of Chemotherapy in Radiology

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Abstract

With fewer significant systemic side effects hepatic arterial infusion of chemotherapy (HAIC) delivers a higher local drug concentration to unresectable liver tumor. In patients with advanced, inoperable primary or metastatic hepatic tumors, it remains an important treatment option due to its higher response rates than systemic chemotherapy. Catheters for HAIC have traditionally been inserted surgically under general anesthesia. The development of interventional radiology has made it possible to quickly insert catheter-port systems under local anesthesia without significantly increasing morbidity.

Keywords: Hepatic; Chemotherapy; Radiology

Introduction

Using the first-pass effects of cytotoxic agents, regional hepatic arterial infusion of chemotherapy (HAIC) delivers a higher local drug concentration to unresectable liver tumors with fewer significant systemic side effects [1]. In contrast to normal hepatocytes, which are primarily perfused by the portal vein, the theoretical basis for treating liver tumors with HAIC is that hepatic neoplasms receive less than 95% of their blood supply from the hepatic artery. Despite having little effect on overall survival time, it has been demonstrated that HAIC has higher response rates than systemic chemotherapy, primarily due to the emergence of extra hepatic metastases. Despite this, HAIC is still an important treatment option for patients with advanced, inoperable primary or metastatic hepatic tumors because it can be administered outside of a hospital setting and can improve many patients' quality of life.

Hepatic arterial catheters were initially inserted surgically under general anesthesia in order to deliver cytotoxic agents to the liver over time. The s.c. was connected to these hepatic arterial catheters ports that make it simple and repeatable to inject chemotherapy directly into liver tumors. Hepatic catheters that are surgically inserted have a high rate of complications. Furthermore, additional surgery is frequently required for port system replacement and repair [2]. Catheter-port systems can now be inserted quickly under local anesthesia thanks to the development and expansion of interventional radiology facilities and methods. Radiologic implantation of hepatic catheter-port systems is a quick and straightforward procedure that does not significantly increase the risk of complications.

Anatomy of hepatic arterial system

The anatomy of the hepatic arterial system is intricate and highly variable. Additionally, the remaining branches of the celiac trunk exhibit anatomical variation. The common hepatic artery divides into the gastro duodenal artery and the hepatic artery proper in standard anatomy, with the latter dividing into two distal branches: the liver's right and left arteries [3]. A 40 percent of examined cadavers have an aberrant hepatic artery, which may originate from a different source than the common hepatic artery. An accessory hepatic artery is one that exists in addition to the normal one. A substitute for an absent normal hepatic artery is referred to as a replaced hepatic artery. Only 55% of the time the typical hepatic anatomy is observed. the numerous other variations of the hepatic blood supply into ten categories, with minor variations in each category. The remaining divisions of the celiac artery also exhibit a great deal of anatomical variation [4,5].

To reduce extra hepatic cytotoxic side effects and optimize the hepatic chemo infusion treatment, precise catheter tip positioning is essential. Therefore, prior to inserting an HAIC, an accurate assessment of the anatomy of the hepatic arterial system is required. Using noninvasive CTA or MRA techniques, a comprehensive and detailed hepatic arterial assessment is typically carried out.

Local anesthesia is used during percutaneous HAIC catheter insertion. iv. hydration prior to treatment >6 hours prior to the procedure, normal saline is recommended. The method used is sterile. In order to anesthetize the arterial puncture and portocath s.c., lidocaine (1% 10-15 ml) is frequently used. pocket locations. If local anesthesia fails to control pain, long-acting analgesics like morphine or fentanyl should be used instead. Benzodiazepines like midazolam are only used in anxious patients [6]. A trained nurse administers all medications other than the local anesthetic. Throughout the procedure, the nurse also regularly monitors the patient's heart rate, oxygen saturation, and electrocardiogram recording. Prior to the procedure, neither conscious sedation nor antibiotic prophylaxis are typically administered.

Discussion

Compared to surgically implanted devices, the interventional port-catheter system for HAIC has developed into a promising alternative. Surgical and interventional insertion of HAIC catheters is only marginally compared in a small number of studies. When compared to the surgical group, the interventional group had a lower mean analgesic requirement (2 versus 9.7 doses) and a shorter length of hospitalization (1.8 versus 8.2 days) after procedures. Compared to surgical port-catheter system implantation, percutaneous interventional catheter insertion has a higher port implantation success rate (100 percent versus 95 percent), catheter patency rate (77 percent versus 50 percent), and longer port duration (19 versus 14 months) [7,8]. When compared to the surgical approach, the interventional technique has a higher rate of device-related complications (63 percent

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versus 40 percent), and catheter dislocation as a result of poor fixation techniques accounts for a significant portion of these complications. These issues are likely to become less common in the future as catheter fixation methods get better. Additionally, interventional revisions have been shown to successfully resolve the majority of these device-related complications, with a rate of 17% of device-related treatment interruption, which is superior to the surgical method [8].

Conclusion

For patients with advanced nonsurgical hepatic primary or metastatic tumors, HAIC remains an effective treatment option. Hepatic arterial catheters can now be placed minimally invasively percutaneously under local anesthesia thanks to recent advancements in interventional radiological techniques. Establishing vascular access, keeping an eye out for complications, and evaluating the results of HAIC treatment regimens all require the expertise of diagnostic and interventional radiologists.

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Conflict of Interest

None

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