The author replies

We are pleased that we have given Mr. Manson the motivation and opportunity to rehearse the arguments that have been raised on so many occasions regarding the relationship of intraoperative cholangiography (IOC) to bile duct injuries. In view of the fact that these injuries are so uncommon, it is not surprising that the data relating the role of IOC in the prevention or attenuation of ductal injuries are imprecise. What is clear is that the type of injury that occurs at laparoscopic cholecystectomy tends to be more severe than that occurring at open cholecystectomy, where excision of a portion of the common hepatic duct and common bile duct is the most common injury. Clearly, for a well carried out and properly interpreted cholangiogram can prevent this serious injury. Repair of a small hole in the bile duct (for insertion of the catheter for cholangiography) is a relatively simple procedure.

Space restrictions prevent a thorough discussion of the topic, but evaluation of the literature suggests that significant bile duct injury is more common in the hands of surgeons who do not perform IOC. This fact does not imply that IOC itself prevents ductal injuries, and in this respect we agree with Mr. Manson. It may be the case that IOC is done out more commonly by surgeons who have a greater degree of specialist interest in biliary tract surgery. Consequently, one might expect that they would also have a lower incidence of ductal injury.

In view of the fact that several years have passed since the two occasions when a clip was temporarily placed across the junction between the cystic duct and the common bile duct in our study, I think we can be reasonably confident that the patients came to no harm. I am not actually aware that the transient occlusion of the duct by a clip can lead to harm so long as long lengths of duct are not mobilized, thus interfering with the blood supply. This is potentially the case, since we employ a reusable clip applier, which has less occlusive force than the disposable instruments.

We agree completely with Mr. Manson that the most fundamentally important step in cholecystectomy is to create a large window between the gallbladder and the other structures of Calot's triangle so that there can be

no doubt that no other ductal structure is passing between them. Once the anatomy has been fully defined, whether or not the cystic artery is divided first, does not seem to be important. At open surgery, fundus-first dissection is used if there is inflammation or fibrosis in Calot's triangle, and we do the same thing at laparoscopic surgery. This is a particularly useful maneuver when operating on patients with acute cholecystitis.

In the majority of cases where the bile duct has been injured, the surgeon is unaware that the injury has occurred at the time of the cholecystectomy. If IOC is to be used to help safeguard the bile duct, then it follows logically that it must be used routinely rather than selectively, although the latter is appropriate to investigate for stones or filling defects in the duct. It may be that the discipline imposed by adequate dissection and mobilization of a length of cystic duct explains the apparent protective effect of IOC as far as bile duct injury is concerned. In this respect, it may be of greater value for the trainee surgeon than for the experienced cholecystectomist. We fully acknowledge that there are many highly expert and experienced biliary surgeons who can perform a perfectly safe laparoscopic cholecystectomy without the need to use IOC.

"Little more need be said" is not a sentiment we would endorse. Rather, we choose to keep an open mind on the subject and to modify practice in the light of further information.

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