

# Answer

## Inside the HiCap Trocar of the Port

**X**-ray film was reviewed by the operating surgeon but it only revealed the metal clips for mesoappendix division. The needle was found inside the chamber of the HiCap trocar with the convex side of the needle fitting perfectly along the bottom of its inner rim (**Figure 2**). The mechanism of the trapped needle was likely owing to premature closure of the valve before the needle passed. The suture might have been grasped too far from the needle end. The operation was completed in 210 minutes. Postoperatively, the patient had ileus, which improved slowly, and was discharged on day 9.

Retained foreign body following surgery has been said to occur during 1 in 7000 to 19 000<sup>1,2</sup> emergency operations, and unexpected change in surgical procedures were found to be independent risk factors.<sup>1</sup> A retained needle during laparoscopic surgery is rarely described in the literature.<sup>3-5</sup> Yet, the exact incidence may be underreported. It may significantly increase the operative time and cause great dilemma to the operating surgeons. First, surgeons may not be experienced in exploration using laparoscopy and may induce further injury to internal organs. Second, formal laparotomy may be the only option in case of failure to identify the object. Both may result in significant morbidity.

On-table x-ray with adequate coverage of the operative field is an important tool to help identify the needle. However, it has several limitations. A study by Macilquham et al<sup>6</sup> found that no observers were able to identify needles shorter than 13 mm. A more recent study by Ponrartana et al<sup>7</sup> showed a significant decrease in the sensitivity of needle identification when the length of the needle decreases from 20 to 10 mm. In addition, an experienced radiologist may not be available during the operation, and the surgeon may need to bear all of the responsibility if the needle is overlooked. In many hospitals, to reduce the cost of surgery, a reusable instrument may be used in common short laparoscopic procedures like laparoscopic appendicectomy, patch repair, and cholecystectomy. In our case, a reusable port with a multifunctional valve was used. A needle trapped in the metallic port will not be shown on x-ray. These ports will also obscure the radiological field.

In this case, the first examination of the questioned trocar failed to identify the needle. It must be stressed that further exploration could have been avoided if it had been examined adequately, with complete removal and disassembling under good lighting.

Based on the above discussions, we would like to suggest the following means to avoid the loss of a needle and help identification during laparoscopic surgery:

1. The port in question should first be removed and examined carefully under good lighting before proceeding to further exploration.

2. A 20-mm or longer needle should be used for suturing to maximize the chance of detection by x-ray.

3. On retrieval of the needle, the grasper should hold the stitch as close to the end of the needle as possible to minimize the chance that the valve of the flapper mechanism closes before the needle is retrieved above it.

4. The needle should be withdrawn slowly, and the laparoscope should keep track of the needle from the operative field until its exit into the port and subsequent complete removal.

5. A port with a controllable valve should be used in case a reusable port is needed, and it should be opened fully until the needle is completely retrieved. If a controllable valve is not available, a reducer can be used to first accommodate the needle and then remove it altogether.

6. All ports should be removed temporarily for x-ray in case reusable ports were used.

7. An experienced surgeon and radiologist should be summoned during the process of identification.

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## Submissions

Due to the overwhelmingly positive response to the Image of the Month, the *Archives of Surgery* has temporarily discontinued accepting submissions for this feature. Requests for submissions will resume in January 2011. Thank you.