

Effectiveness of a Surgical Glove Port for Single Port Surgery

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Abstract

Background A new surgical concept, such as single port surgery (SPS), usually raises many questions regarding safety, usefulness, appropriateness, applicability, and cost. Because many new port devices have been developed, choosing the type of port device for SPS is the most important factor. We herein briefly report our newly developed SPS port made using a standard surgical glove.

Methods SPS starts with a 1.5-cm skin incision on the umbilicus. Subsequently, a wound retractor of XS size is installed at the umbilical wound. Then, a non-powdered surgical glove (5.5 inches) is put on the wound retractor through which three 5-mm slim trocars are inserted via the finger tips. A semi-flexible laparoscopic camera is inserted via the middle finger port. From June to December 2009, 23 cases of SPS (20 cholecystectomies, 1 choledocholithotomy, 1 appendectomy, and 1 gastropexy) were performed in our institute using this technique.

Results All cases were successfully performed without any intra- or postoperative complications. No conversion to other procedures was needed. The median operative time for cholecystectomy was 110 (range, 55–170) min.

Conclusions This surgical-glove port is easy to install and is made from conventional, commonly used surgical equipment, making it unnecessary to purchase any expensive new devices. This surgical-glove port technique is a

promising method to introduce SPS, because developing or purchasing new devices is unnecessary. Our experience demonstrates the efficacy, appropriateness, and cost-effectiveness of this simple port technique.

Introduction

Single port surgery (SPS) is expected to be the next minimally invasive surgery and has been indicated for various procedures [1–3]. A new surgical concept usually raises many questions regarding safety, usefulness, appropriateness, applicability, and cost. Because many new port devices have been developed, choosing the type of port device for SPS is the most important factor. The cost for novel surgical procedure is always significant issue in most countries [4–7]. Moreover, postoperative pain, one of the vital advantages of SPS, depends on the wound size, which is determined by the port device. We herein briefly report our newly developed SPS port made using a standard surgical glove.

Methods

SPS starts with a 1.5-cm skin incision on the umbilicus without dissection of subcutaneous tissue. Subsequently, an ALEXIS[®] wound retractor (Applied Medical, Rancho Santa Margarita, CA, USA) of XS size is installed at the umbilical wound. Then, a non-powdered surgical glove (5.5 inches) is put on the wound retractor air-tightly, through which three 5-mm slim trocars (LiNA Medical, Glostrup, Denmark) are inserted via the finger tips (Fig. 1). A semi-flexible laparoscopic camera (LTFVH, Olympus, Tokyo, Japan) is inserted via the middle finger port, while

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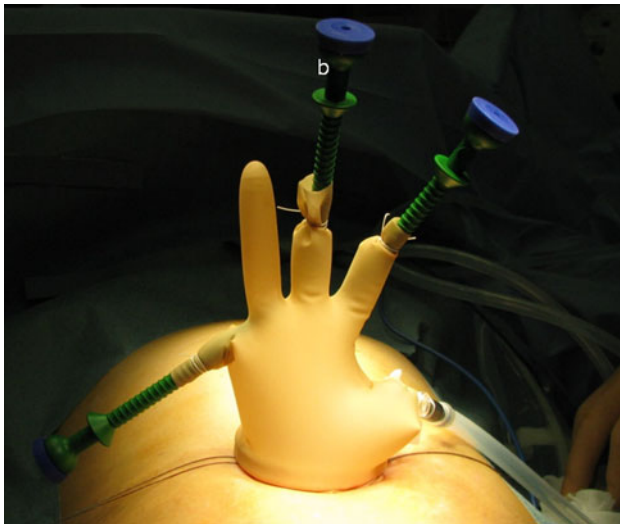


Fig. 1 Exterior view of surgical glove port: three slim ports were inserted via the finger tips. Pneumoperitoneum was controlled by a CO₂ insufflator connected to a small finger

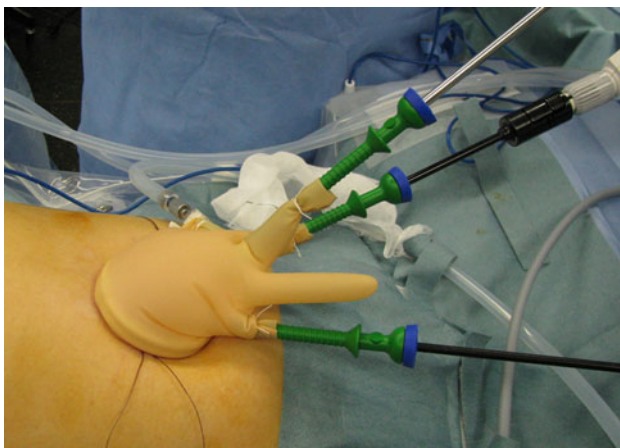


Fig. 2 Intraoperative view of the surgical globe port; note that separation of trocars allows for full movement of instruments

the other finger ports are used for operator's instruments (Fig. 2). From June to December 2009, 23 cases of SPS (20 cholecystectomies, 1 choledocholithotomy, 1 appendectomy, and 1 gastropexy) were performed in our institute using this technique.

Results

All cases were successfully performed without any intra- or postoperative complications. No conversion to other procedures was needed. There were no perioperative port-related or surgical complications. The median operative time for cholecystectomy was 110 (range, 55–170) min.

Discussion

This surgical-glove port is easy to install and is made from conventional, commonly used surgical equipment, making it unnecessary to purchase any expensive new devices. The wound retractor used allows a 2.5-cm × 2.0-cm, oval-shaped, free hole to be obtained with a 1.5-cm skin incision, which facilitates smooth movement of instruments and easy position changes (Fig. 3). We believe that a 1.5-cm skin incision is a minimal incision for cholecystectomy and may contribute to less postoperative pain. The slim ports, attached to the tips of the glove fingers, are thin enough to avoid conflicts between the instruments compared with conventional laparoscopic ports.

Recent increases in health care and surgical expenditures are a significant issue in most countries [8]. Generally, new techniques are rarely less expensive than reliable old ones. A new surgical device costs more than conventional devices, because developing a new device demands heavy investment. However, our surgical-glove port costs only 13,400 yen (approximately \$147 U.S.), which is one-quarter of the cost of conventional four-port laparoscopic surgery. Because laparoscopic cholecystectomy is one of the most common operations, total cost reduction cannot be ignored, and this, along with its safety and simplicity, would be one more essential reason for its use.

SPS will spread more widely in the near future driven by both patients' requirements and new surgical device development, although there is still a need for prospective randomized trials to confirm the benefits of SPS compared with the conventional approach. This surgical-glove port technique is a promising method to introduce SPS, because developing or purchasing new devices is unnecessary.

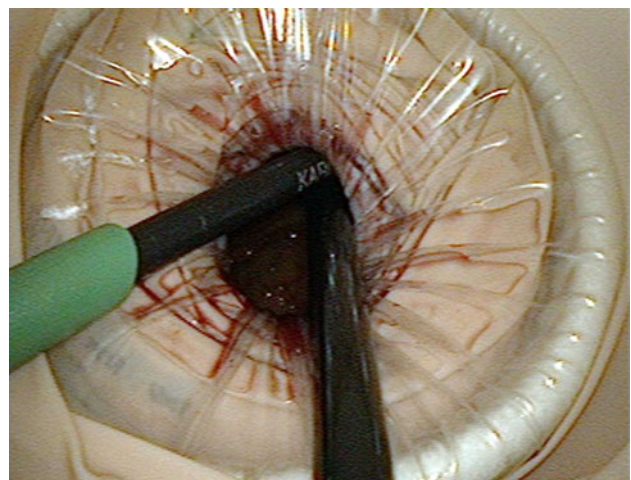


Fig. 3 Inside the surgical glove: a single free hole is seen made with an Alexis XS-size wound retractor. Two 5-mm instruments are inserted in advance

In conclusion, our experience demonstrates the efficacy, appropriateness, and cost-effectiveness of this simple port technique.

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