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Perioperative nursing for laparoscopic liver resection

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Abstract: Sir Run Run Shaw Hospital (SRRSH) has developed a form of laparoscopic hepatectomy, resecting by curettage and suction. Such resection has been carried out successfully in 6 patients who had liver tumors. The results are satisfactory. And after the operation, there is a very effective perioperative nursing ensuring the patient's recovery.

Key words: Hepatectomy, Laparoscope, Nursing
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INTRODUCTION

As the liver is a highly vascular organ located in an obscure space, laparoscopic hepatectomy is difficult (Wu, 2000). Other influencing factors include narrowed vision of the operative field and limited entry of the instrument. Laparoscopic hepatectomy is still in its beginning stages. Few cases are reported internationally and only 6 are reported domestically.

Recently, Sir Run Run Shaw Hospital has developed a form of laparoscopic hepatectomy, resecting by curettage and suction (Cai and Li, 2001). Such resection has been carried out successfully in 6 patients (3 males and 3 females, Table 1) who had liver tumors. The results are satisfactory. Below is a summary of the perioperative nursing care given in these cases.

NURSING

Preoperative preparation

1. Assessment: This includes both psychological and physical factors:

(1) Psychological assessment: Most patients are worried about the operation, anesthesia and post-operative pain (Yuan, 2001). Fear and anxiety is exhibited in various ways. The nurse should be sensitive to these worries and deal with them properly. The medical staff should also pay special attention to their bedside manner and be tactful. Positive interaction affirms the patient's confidence in the doctor, while negative statements may lead to unnecessary worry over the operation.

(2) Physical assessment: Besides the disease it-

Table 1 Clinical data on the six patients

Patient	Gender	Age	Diagnosis	Tumor site and size (cm)	Operative name
1	Female	50	Primary right liver cancer (AFP 2120 ng/ml)	Segment V 2×2×3	Segment V resection and cholecystectomy
2	Male	42	Right liver angioma and cholecystolithiasis	Segment VI 3×3×4	Segment VI resection and cholecystectomy
3	Male	69	Primary left liver cancer (AFP 602 ng/ml)	Segment III 3×3×4	Segments II+III resection Segment IV partial resection
4	Female	48	Right liver angioma and cholecystolithiasis	Between segments VI and VII 3×3×3	Segments VI, VII partial resection and cholecystectomy
5	Male	44	Left liver angioma and cholecystolithiasis	Segment III 3×4×4	Segment III resection and cholecystectomy
6	Female	52	Right liver angioma and cholelithiasis	Segment VI 3×3×2	Segment VI resection and cholecystectomy

self, it is also essential to complete a full physical examination, evaluating the patient's condition and foreseeing any potential risks (He and Yin, 1999). Diagnostic examinations and laboratory data are also imperative. Setting up an ideal laparoscopic environment requires specific hemodynamic variables. The diaphragm is also raised, affecting the respirations of the patient (especially the elderly). Thus, it is essential to examine the cardiovascular and respiratory systems of patients older than 50 years of age, and in patients who have cardiovascular and respiratory diseases, as well as those who have had a long smoking history.

2. Preoperative nutritive therapy: It is also very important to maintain and improve liver function prior to the operation. High-glucose, high-protein food rich in vitamins benefits the liver by increasing its store of hepatic glycogen and raises plasma protein, decreasing gluconeogenesis and protein consumption (Yang and Zheng, 1998). A patient who is malnourished has less ability to endure the procedure, may need longer healing time and has poorer defense against infection. In such cases, it is necessary to implement TPN therapy, with a preferred ratio of twice as much glucose to fat. If plasma proteins are low and hemoglobin is less than 100 g/L, physician orders may include infusion of human albumin, amino acids and essential vitamins. Some oral medicines, like Yiganling, PDP, Vitamin B, Vitamin E, etc., are also helpful. To enhance the coagulation time, it is helpful to inject Vitamin K preoperatively.

3. Skin and intestinal preparation: Generally, there are 4 small incisions in a laparoscopic operation. Besides the arc incision 1 cm beneath the umbilicus, the other 3 incisions are selected according to the tumor site (Chen, 2000). The central and right abdominal skin is prepared, and shaving is usually unnecessary. However, for an incision near the umbilicus, where dirt stores easily, it is a must to thoroughly wash the umbilicus with soap or terebenthene to avoid possible infection. For the patient who has thick body hair, it is recommended to shave in the operation room before the operation starts.

The patient should fast 8 h before and have an enema before the operation to help postoperative recovery of gastrointestinal function. Traditionally, the gastrointestinal tubes and foley catheter are inserted in the unit but this leads to higher incidence of patient discomfort. SRRSH's mission is to treat patients with respect and dignity. Therefore, such tubing is placed post anesthesia in the operation room.

4. Antibiotics in pre-operative room: Prophylactic antibiotics are given in the pre-operative room. Once the incision is made, the risk of infection is heightened. This vulnerable period lasts about 1–2 h. Antibiotics should be administered 2 h before the operation (Huang, 2000).

Cooperation during operation

The operation is done under general anesthesia. The scrub nurses help the anesthetist to arrange body position according to physician order. They also help the surgeon to bring about aeroperitoneum, checking the abdominal pressure. The scrub nurse regularly checks the crackle in the patient's clavicles so that aerodermectasia may be avoided in a timely manner.

Postoperative nursing

Postoperatively, the patient is sent to the post-anesthesia care unit where he/she recovers with vital signs being monitored. When the patient is alert and the SaO_2 is higher than 95% with stable vitals, the anesthetist will pull out the endotracheal tube and the PACU (post anesthesia care unit) nurse will accompany the patient to the ward. During the transfer, the patient should be oxygenated.

1. Observation of bleeding: Bleeding during and after a hepatectomy is a serious symptom; typically occurring within the first 24 h postoperatively. Incisional oozing and bleeding easily occurs due to the liver's highly vascular nature. Thromboasthenia related to serious hepatic malfunction and accidental loosening of the hemostat are common causes. Therefore the nurse should keenly observe for oozing and bleeding within the first postoperative 24 h. Urine count and abdominal distention should be documented. Blood pressure and pulse should be monitored hourly and special attention should be paid to the abdominal tube and its drainage. If the volume is larger than 200 ml per hour and the tube is warm, active bleeding should be suspected. When the patient's pulse increases, and the blood pressure drops and the figure between the highest and lowest pressure shortens, medication and blood transfusion should be started. In the meantime the situation should be reported to the doctor immediately. Local inflammation due to poor drainage may also result in collateral bleeding. The nurse should also keep a close watch for gastrointestinal complications, such as vomiting, abnormal stool color and character, etc.

2. Respiratory management: Monitor respira-

tions closely, administering oxygen at 3 L/min both to adequately oxygenate and help liver cells recover (Yang and Zheng, 1998). As liver resection is performed by general anesthesia, endotracheal intubation hurts the tracheal mucosa. Besides, ventilator respiration, anesthetic and fear of pain, the patient dares not cough after operation that will cause the accumulation of secretion, it may lead to pneumonia. Postoperative day 2, the nurses need to do chest physiotherapy, and splint the incisional area when coughing. The patient should be told to change body posture regularly and practise deep breath.

3. Observation on drainage tubes: Attach the drainage tube properly, preventing twisting or disattachment. Empty the drainage bag regularly and observe the color, volume and quality of the drainage fluid. Change the drainage bag every day. The drainage bag should not be higher than the abdomen to avoid drainage backflow which could lead to infection. If the drainage volume decreases over 3–4 d post operatively, the tube can be pulled out. However if the drainage volume sharply increases and the color turns red, also accompanied by vital sign changes, bleeding should be suspected. If the drainage fluid looks like bile, it should be reported to the doctor immediately to find out the reason and take appropriate action.

Health education

Upon patient admission, besides a brief introduction about the ward, regulations regarding visiting hours, forbiddance of smoking, etc., his/her knowledge regarding health should be assessed and he/she should be provided information regarding the disease The patient should be taught and encouraged to cooperate with the medical team pre- and post-operatively. For example, the nurse can demonstrate how to protect the drainage tubes, practice deep breathing, and demonstrate coughing effectively in order to expectorate. The patient should be taught the importance of early ambulation after the operation, and receive guidance about lifestyle issues such as diet, abstinence from alcohol and cigarettes. They should also learn to take their medicines correctly. Medication harmful to the liver should be pointed out. Liver function and other relevant items should be checked regularly.

EXPERIENCE

The liver is highly vascular because it is a parenchymal organ. It is not easy to interrupt the blood flow of the hepatic portal vein during laparoscopic procedures. In addition, it is hard to control bleeding incisions of the liver. More than 80% of patients diagnosed with liver cancer are accompanied by differing levels of cirrhosis. Preoperatively, care is provided to maximize physiological relaxation. Postoperatively, observation for possible complications and relevant solutions are most important. Under these circumstances, the 6 patients who underwent laparoscopic hepatectomy recovered very well. No complications occurred (Table 2).

Table 2 Treatment result of 6 patients

Case	Duration of operation (min)	Blood loss (ml)	Incision size (cm)	Postoperative complication	Day started eating	Discharge (d)
1	90	150	6×5×5	Nil	1	7
2	75	300	5×4×3	Nil	2	8
3	240	2000	10×9×7	Nil	3	9
4	150	1500	4×3×3	Nil	1	6
5	740	200	5×4×3	Nil	1	6
6	60	300	4×3×2	Nil	1	5

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