Journal of Microbiology and Infectious Diseases / JMID
2013; 3 (1): 1-2
doi: 10.5799/ahinjs.02.2013.01.0069

REVIEW ARTICLE

Laparoscopic splenectomy and infection

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ABSTRACT

Partial laparoscopic splenectomy is performed commonly in hereditary spherocytosis. Vaccination against capsulated bacteria is essential before undergoing splenectomy. Hand-assisted laparoscopic splenectomy is known to be effective and convenient in the removal of a spleen larger than 20 cm in size. Laparoscopic splenectomy provides less hemorrhage, reduced surgical trauma and pain, shorter duration of hospital stay, and early recovery. Laparoscopic approach was particularly effective in reducing the infectious complication rate compared with the open surgery. Infectious complications of splenectomy were observed to be wound infection, subphrenic abscess, and sometimes pulmonary infection. *J Microbiol Infect Dis 2013; 3(1): 1-2*

Key words: Laparoscopy, splenectomy, infection

Laparoskopik splenektomi ve enfeksiyon

ÖZET

Kısmi laparoskopik splenektomi kalıtsal sferositozda yaygın olarak uygulanmaktadır. Splenektomi yapılanlarda kapsüllü bakterilere karşı aşılama gereklidir. El-yardımlı laparoskopik splenektominin boyutu 20 cm'den daha büyük bir dalağın çıkarılmasında etkili ve uygun olduğu bilinmektedir. Laparoskopik splenektomi daha az kanamaya, cerrahi travma ve ağrıda azalmaya, hastanede kalış süresinde kısalmaya ve erken iyileşmeye neden olur. Açık cerrahi ile karşılaştırıldığında laparoskopik yaklaşım enfeksiyöz komplikasyon oranının azaltılmasında özellikle etkilidir. Splenektominin enfeksiyöz komplikasyonları olarak yara enfeksiyonu, subfrenik apse ve bazen akciğer enfeksiyonları görülmektedir.

Anahtar kelimeler: Laparoskopi, splenektomi, enfeksiyon

INTRODUCTION

Splenectomy was first reported in adults by Delaitre and Maignien, and in children by Tulman et al. in 1991.[1] Partial laparoscopic splenectomy is applied commonly particularly in hereditary spherocytosis. Vaccination against capsulated bacteria (*Streptococcus pneumoniae, Haemophilus influenzae, and Neisseria meningitidis*) is essential before undergoing splenectomy. Hand-assisted laparoscopic splenectomy is known to be effective and convenient in the removal of a spleen larger than 20 cm in size.[2] During recent 10 years, laparoscopic splenectomy (LS) has become a standard procedure in the removal of spleen which is normal to moderate in size.[3]

In a study which conducted between 1995 and 2006, 231 children (129 male and 102 female) underwent 211 total and 12 partial LS. The disease group was consisted of 111 hereditary spherocytosis, 36 immune thrombocytopenic purpura, 51 sickle cell anemia, and 25 other patients, among whom only 2 pneumonia cases were determined demonstrating a postoperative infectious complication.[4]

Laparoscopic splenectomy provides less hemorrhage, reduced surgical trauma and pain, shorter duration of hospital stay, and early recovery. Robotic laparoscopic splenectomy enables 3D (dimension) view and higher range of motion. However, it has no significant superiority over classic laparoscopic splenectomy. In a 7-year study, 45 patients received robotic laparoscopic surgery and 45 patients underwent classic laparoscopic splenectomy. Two weeks prior to the procedure, vaccination against capsulated bacteria was delivered. At the end of the study, no complication was observed.[5]

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Received: 30.07.2012 Accepted: 25.11.2012

Another study conducted between 1994-2006 included 140 laparoscopy patients including 104 benign cases (idiopathic thrombocytopenic purpura, 68; hereditary spherocytosis, and 36 malignant cases (Non-Hodgkin's lymphoma, 19; chronic lymphocytic leukemia, 10). Splenectomy was performed in 18 patients (17 laparoscopic and 1 open surgery cases) with a spleen larger than 20 cm. Thus, the feasibility of removal of a spleen larger than 20 cm by laparoscopic approach was shown. Postoperatively, 1 infected hematoma (over the splenic bed area), 6 pneumonia, and 2 port site infections were determined.[6]

While 5-port splenectomy technique has previously been the classic method, Park et al. has started to use 4-port technique and lateral approach in adults since 1994. In children, this technique was started to be applied in 1996. In a 10-year study on pediatric patients, 47 anterior and 37 lateral approaches were applied. Study group was consisted of 57 spherocytosis, 16 idiopathic thrombocytopenic purpura, 4 lymphoma and 3 sickle-cell anemia cases. During early postoperative period, anterior group exhibited 9 complications and 1 wound infection in the diaphragm, whereas during the late postoperative period, anterior group displayed 2 infections which were phrenic abscess and pulmonary infection. Lateral group demonstrated no postoperative infectious complication.[7]

In another study comprised of 100 cirrhosis patients (54 male and 46 female) that were not suitable for interferon therapy in hepatitis C because of hypersplenism associated with compensated cirrhosis and resultant thrombocytopenia and leukopenia, the patients underwent LS. Laparoscopy was applied as pure laparoscopy (n=78) and hand-assisted laparoscopy (n=22). No complications were seen intraoperatively. During the postoperative period (7-18 days), 1 subphrenic abscess and 4 wound infections were determined. Despite pneumococcal vaccination 3 weeks before splenectomy, pnemococcal meningitis was found in 1 patient at late postoperative period (20-47 months). Postoperatively, significant improvements were observed in blood parameters: platelet count ($\times 10^3/mm^3$), 56 ± 21 (preop) vs. 222 ± 98 (postop); leukocyte count ($/mm^3$), 3186 ± 1138 (preop) vs. 5167 ± 1383 (postop); neutrophil count ($/mm^3$), 1580 ± 762 (preop) vs. 2170 ± 920 (postop); hemoglobin (g/dl), 12.8 ± 1.5 (pre-operative) vs. 12.5 ± 1.4 (post-operative).[8]

In a study evaluating liver cirrhosis secondary to hypersplenism, 24 cases received LS (Group 1), 24 cases underwent open splenectomy (OS) (Group 2), and 68 cases received ITP laparoscopic splenectomy (Group 3). Postoperatively, Group 1 and 2 demonstrated significantly elevated leukocyte and hemoglobin levels, while exhibiting decreases in transaminase and bilirubin concentrations. The postoperative infectious complications were pulmonary infection in 5 (Group 1: 1, Group 2: 2, Group 3: 2), splenic fossa abscess in 2 (Group 1: 0, Group 2: 1, Group 3: 1), and incision infection in 4 (Group 1: 0, Group 2: 3, Group 3: 1) cases.[9]

A meta-analysis evaluated 51 case series published in English between 1991-2002 which consisted of 2940 patients in total (2119 LS and 821 open surgeries). Laparoscopic approach was particularly effective in reducing the infectious complication rate compared with the open surgery (1.0% vs. 3.8%, $p<0.001$). Infection rate (including wound, pulmonary, urinary infections) was 2.6% in LS and 7.3% in OS groups ($p<0.001$). Other infections consisted of subphrenic abscess, sepsis, and prolonged fever. Subphrenic abscess rate was 0.7% in the LS group and 2.4% in the OS group.[10]

In conclusion, infectious complications of LS were observed to be wound infection, subphrenic abscess, and sometimes pulmonary infection.

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