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Original Article *Özgün Araştırma*

DOES THE RESTING TIME AFTER EMERGENCY SPLENECTOMY AFFECT THE FREQUENCY OF POST-SPLENECTOMY INFECTIONS?

Post-Splenektomi Enfeksiyon Gelişiminde İstirahat Süresinin Önemi Var Mı?

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ABSTRACT

Objective: Although many complications may occur after splenectomy, post-splenectomy infection is one of the most frightening complications. Many prophylaxis methods have been used for this condition with very high rates of mortality and morbidity. In this study, we aimed to examine post-splenectomy infectious complications, in the cases in which all the measures were taken.

Material and Methods: Thirty-two patients who underwent emergency splenectomy were included in the study. Patients were given a sick leave of 20 days on isolated spleen trauma and at least 20 days for multitrauma patients. It was observed that some of the patients had started to physically heavy work due to socioeconomic reasons despite the sick leave report. A comparison was performed between the patients who completed 20 days of rest (19 cases) (Group-1) and the patients who started to work after resting time of less than 20 days (Group-2), in terms of the frequency of postoperative infection.

Results: In Group-1, only 1 case had a simple infection that could be taken under control with a simple antibiotic, while in Group 2, in 3 patients incision site infection, in 2 patients severe atypical pneumonia requiring hospitalization and in 1 patient severe viral gastroenteritis requiring daily hospitalization were observed. Although there is an insufficient number of patients in the groups, there is a statistically significant difference in terms of the frequency of infection between the groups ($p<0.05$).

Conclusion: Especially in the regions with low socio-economic status, sick leaves could not be used properly. This study, showed that dehydration and malnutrition, which may be secondary to heavy work, contribute to the development of infection by suppressing the immune system, in addition to the defect caused by major surgical intervention and splenectomy in the immune system, resulting in the high frequency of infection.

***Keywords**: Emergency splenectomy, OPSI, post-splenectomy sepsis, post-splenectomy infection, sick leave*

ÖZ

Amaç: Travmaya sekonder gerçekleştirilen splenektomiler sonrası birçok komplikasyon gelişebilmekle beraber en korkulan komplikasyonlardan biri erken enfeksiyonlardır. Morbidite ve mortalitesi son derece yüksek olan bu komplikasyondan korunmak için aşılama dahil birçok profilaksi metodu kullanılmaktadır. Bu çalışmada tüm önlemler alınmış bulunan olgularda, bedenen aktif-ağır çalışmaya başlamanın post-splenektomi enfeksiyöz komplikasyonlara etkisini incelemeyi hedefledik.

Gereç ve Yöntemler: Acil splenektomi yapılan 32 hasta çalışmaya dahil edildi, izole dalak travması sonucu opere edilen hastalara 20 gün, multitravma ile birlikteliği bulunan dalak yaralanması sonucu opere edilen hastalara ise hastanın genel durumuna göre en az 20 gün istirahat raporu verildi. Taburculuk sonrası postoperatif 10, 15 ve 30 uncu günlerde kontrole çağırılan hastaların bazılarının rapora rağmen sosyoekonomik sebeplerden ağır fiziksel çalışmaya başladığı gözlendi. Yirmi gün istirahatini tamamlamış olgularla (19 olgu) (Grup-1), 20 günden daha az istirahat süresi ile çalışmaya başlayan hastalar arasında (13 olgu) (Grup-2) postoperatif enfeksiyon sıklığı açısından karşılaştırma yapıldı.

Bulgular: Grup-1 de yalnız 1 olguda insizyon hattında, basit antibiyotikle kontrol altına alınabilen basit enfeksiyon gözlenirken, Grup 2 de 3 olguda kesi yeri enfeksiyonu, 2 olguda hastaneye yatış gerektiren ciddi atipik pneumoni, 1 olguda ise günübirlik yatış gerektiren ciddi viral gastroenterit gözlendi. Gruplarda bulunan hasta sayısı yetersiz olmakla birlikte gruplar arasında enfeksiyon sıklığı açısından istetistiksel olarak anlamlı fark bulunmaktadır ($p<0.05$).

Sonuç: Ülkemizin özellikle sosyo-ekonomik olarak geride kalmış bölgelerinde major cerrahi girişimler sonucu istirahat süreleri yeterli derecede kullanılamamaktadır. Bu çalışmada gelişen yüksek enfeksiyon sıklığı gözönüne alındığında, major cerrahi girişim ve splenektominin immün sistemde yarattığı defekte ilaveten, ağır çalışmaya sekonder oluşmuş olabilecek dehidratasyon ve malnutrisyonun da immün sistemi baskılamak suretiyle enfeksiyon gelişimine katkıda bulunduğunu düşünmekteyiz.

***Anahtar Kelimeler**: Acil splenektomi, OPSI, post-splenektomi sepsis, post-splenektomi enfeksiyon, istirahat*

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INTRODUCTION

Since the first deliberate removal of a diseased spleen by Quittenbaum in 1826, splenectomy has become a well established surgical procedur (1). A spleenless existence was considered to be quite safe as the spleen was considered unnecessary for life until 1952 when King and Schumacher drew attention to the risk of overwhelming post splenectomy infection (OPSI) (2). Since that time enthusiasm for splenectomy has diminished. The spleen clearly serves extremely important haematological and immunological functions. As part of the reticulo-endothelial system and by receiving 25% of the cardiac output, it plays a major part in the immediate immunological response to blood-borne antigens akin to the phagocytic role of 'Kupffer' cells of the liver in the portal circulation (3). As the spleen is responsible for making antibodies and removing bacteria, aged, antibody-coated and damaged blood cells, those without a spleen have an impaired immune system (4,5). Because of this, splenectomized patients have a more difficult time recovering from pneumonia, meningitis, haemophilus influenzae (Hib) flu, sepsis, nosocomial infections, babesiosis (a tick-borne disease), malaria and other parasitic diseases and gram-negative bacterial diseases from animal bites (6-8). In this study we investigated the possible effect of sick leave time on post-splenectomy infections.

MATERIALS AND METHODS

Thirty-two patients who underwent emergency splenectomy for Grade 3-4 injury were included in the study. Abdominal exposure was accomplished with an upper midline incision. Upon entry into the abdominal cavity, dissection was performed with blunt and sharp technique and open splenectomy was performed. After removal of the spleen, hemostasis was obtained and confirmed in a systematic fashion through careful inspection of the left subphrenic area, the greater curvature of the stomach, and the short gastric vessel area, as well as the splenic hilum. A rubber drain was placed in the operation area and abdominal incision was closed.

Pneumococcus, meningococcus and *Hemophilus influenzae* Type B vaccination were completed. After discharge, patients who underwent surgery for isolated spleen trauma were given a 20-day, patients who were operated as a result of splenic injury associated with multi-trauma were given a sick leave report of at least 20 days according to the general condition of the patient. It was observed that some of the patients who were called for control on postoperative 10th, 15th and 30th days after discharge had started physically heavy work due to socioeconomic reasons despite their sick leave report. All these patients were seasonal rural worker who works approximately 14 hours a day on a plantation in a city in which 24 hour mean temperature on summer is 36.1°C. A comparison was performed between the patients who completed 20 days of rest (19 cases) (Group-1) and the patients who started to work after a resting time of less than 20 days (Group-2), in terms of the frequency of postoperative infection. SPSS for Microsoft 17 program used for statistical analysis. Student-t test and ki-square test were used.

RESULTS

The mean age of patients was 22.4 and all were male. Perioperative infective complications accounted for most of the morbidity, which included lower respiratory tract infections (4 cases), intra-abdominal collections, wound infection and non-specific infections requiring antibiotics. The remaining perioperative complications included retention of urine (2 patients), wound haemorrhage (1 case), pulmonary embolus and shingles (1 case), and acute alcohol withdrawal (2 cases). Long-term complications included one readmission with adhesion related small bowel obstruction that settled with conservative

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management and chronic pain relating to the operative wound in five cases.

Multiorgan failure as a direct result of the trauma, postoperative haemorrhage or sepsis was the main cause of operative mortality of 2 patients.

Following emergency splenectomy, the operative morbidity and mortality rates were 21.6% (8 cases) and 13.5% (5 cases) respectively.

In Group-1, only 1 case had a simple infection that could be taken under control with a simple antibiotic, while in Group 2, in 3 patients incision site infection, in 2 patients severe atypical pneumonia requiring hospitalization and in 2 patient severe viral gastroenteritis requiring daily hospitalization were observed. Although there is an insufficient number of patients in the groups, there is a statistically significant difference in terms of the frequency of infection between the groups ($p<0.05$).

DISCUSSION

It is well established that splenectomy leads to depressed phagocytosis, decreases serum levels of Immunoglobulin M and antigen response, and facilitates of environment wherein erythrocytes rid themselves of solid waste material (9). The risk of overwhelming infection is more than 50-times higher in post splenectomy patients compared to the general population (10). Host defense against infection is altered after splenectomy and such individuals develop sepsis more easily and the infection has a fulminant course (11). This phenomenon is called overwhelming post-splenectomy infection (OPSI). In the initial stage of OPSI patients usually experience abdominal pain, lethargy, weight loss, headache, nausea and vomiting.

Meningitis and pneumonia are often associated in the more severe stages. The patients' clinical state can quickly deteriorate, leading to coma and death (12). There is a lifelong risk for developing OPSI with the highest incidence in the first two years post-splenectomy (13). Because of the high fatality rate (46%) associated with OPSI, asplenic individuals need to be vaccinated against encapsulated bacteria, which are most frequently responsible for the infection (i.e. pneumococcus, meningococcus and Haemophilus influenzae type b) (14,15). Some authors also recommend annual vaccination against influenza virus, because influenza predisposes to sepsis and pneumonia (16,17). Splenectomized patients are also more prone to develop infections caused by Babesia, capnocytophaga or anaplasma phagocytopilum (11). The problem is for these kinds of infections is no immunization or treatment is available on these conditions. Capnocytophaga is usually transmitted through dog bites; hence asplenic patients should be instructed to seek medical assistance quickly after such event. Also there is a higher prevalence of malarial parasite infection but it is uncertain whether such patients have also a higher mortality rate (11).

As in vitro studies showed the effects of serious fatique as induced Natural Killer cell activity, supressed lymphocyte mytogene response and increased corticotropin-releasing factor levels; it is very much important to maintain optimal resting and ensure the most effective immune response after splenectomy which results with immunesupression itself. Our study indeed showed the significant importance of resting after splenectomy procedure to avoid OPSI.

Conflict of Interest: None.

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