**Non surgical treatment of recurrent or stuttering priapism in sickle cell children**

Jianmin Liu, **MD**, Mared A. Al-Hothari, **BD**, Faiz A. Mahboob, **BD**.

Sickle cell is a recessively inherited condition in which synthesis of hemoglobin is abnormal. The disease is characterized by chronic anemia, susceptibility to infection, and bouts of severe pain and organ dysfunction. The disease causes microvascular occlusion, which is manifested in most organ systems. There is a 6.4% incidence of priapism among sickle cell clinic patients.

Priapism is a prolonged painful erection for more than 6 hours. It is not related to sexual activity and occurs most commonly in patients with sickle cell disease, and it is a relatively frequent complication that results from the pooling of blood in the corpora cavernosa, causing obstruction of the venous outflow. Stuttering or recurrent priapism occurs often in patients with sickle cell trait or disease and in patients without sickle cell disease with prior episodes. The patient usually presents with a painful, spontaneous erection of several hours’ duration. Physical examination reveals the penis to be rigid and mildly tender; the glans penis, however, is usually flaccid.

Although the main reservoir of sickle cell disease is tropical Africa and Madagascar, where the incidence may be as high as 40%, it is relatively common in Turkey, Greece and other Mediterranean countries including North Africa. The priapism in sickle cell anemia is relatively common in Yemenis. From November 2001 to March 2003, we treated 3 recurrent or stuttering priapism child patients. One 12-year-old boy had sudden, painful penile erection for more than 8 hours. There was a history of priapism 6 months previous. Another 12-year-old boy had painful, persistent penile erection that lasted more than 2 days with a history of priapism 3 times before; and a 13-year-old boy had painful, intermittent erection for 2 days with persistent penile erection for more than 20 hours. Examination revealed pale, dehydrated, anicteric adolescents with full non-pulsatile penile erection and engorged superficial penile veins. The color of penis was gray purple. The glans penis and corpus spongiosum were soft. The corpora cavernosa were fully rigid and tense with congested blood and tender to palpation and with a cool feeling. The urethral meatus, scrotum and rectum were normal. They had been diagnosed as suffering from sickle cell anemia, with genotype hemoglobin SS. There was no history of recent drug ingestion or neuro-psychiatric disturbance. Investigations showed a hemoglobin of 6.8-9.1 g/dl, white blood cell count 12.2-15.3x10^9/l (neutrophils 60-68%, lymphocytes 30-35%, monocytes 3-5%, basophils 0-1%, eosinophils 0-1%); platelets 220-250,000/mm^3; blood smear showed numerous sickled cells and occasional target cells but no parasitemia. Blood biochemistry was normal. Other investigations were normal, and the diagnosis of low-flow recurrent or stuttering priapism was made. We performed aspiration of the corpora and intravenous injection with an alpha-adrenergic agonist ephedrine bilaterally. We performed initial aspiration of the corpora via a 21-gauge butterfly needle, followed by injection of 50 mg ephedrine, a pure alpha-adrenergic stimulant, until detumescence took place. The ephedrine solution was made by mixing 50 mg/ml of ephedrine with 19 ml of normal saline. Intracavernous injection and irrigation with diluted alpha-adrenergic solution every 5 minutes until detumescence after aspiration of 10-20 ml of blood. At the same time as the injection we pressed the penis 2-3 times promoting detumescence until the penis became warmer and reddish. After 15-30 minutes, the erectile penis became flaccid, and 2 priapisms were converted into nonischemic priapism, and then sustained detumescence was noted. The 13-year-old boy’s priapism recurred 2 times, 6 hours later and the next day; then we used an 18-gauge needle aspirating corpora cavernosa through the glans to evacuate the sludged blood, injected ephedrine 50 mg twice under anesthesia, then the erectile penis became flaccid. At the same time, 5% dextrose and Ringer’s solution were given to adjust the occult misbalance of acid-base and electrolyte. Blood transfusion was applied to the patients receiving aspiration of corpora cavernosa. After the injection, erectile penis became flaccid, and 2 priapism were converted into nonischemic priapism, and then sustained detumescence was noted the next day; recovery was sustained and complete. The 13-year-old boy’s priapism recurred the next day, after aspirating corpora cavernosa, injecting ephedrine 50 mg twice, the erectile penis was flaccid. Sustained detumescence was noted on the second post-admission day; recovery was sustained and complete. No acute hypertension, headache, palpitation and cardiac arrhythmia occurred after injection of alpha-adrenergic agents, and no bleeding, hematoma, infection and urethral injury were found in these patients.

The genitourinary tract is most commonly affected by hematuria, urinary tract infection and priapism but other more serious sequelae have been identified in sickle cell disease.¹ The diagnosis and management of sickle cell disease has advanced rapidly with a significant increase in the life expectancy of affected patients and recognition of a greater number of genitourinary complications. Renal function may be mildly altered or lost completely. Patients with sickle cell disease are at increased risk for urinary tract infection. Priapism is a painful complication of sickle cell disease that is poorly understood and challenging to treat and prevent. Testicular infarction has also been noted. Furthermore,
Sputtering priapism in sickle cell children

Stuttering priapism is the persistence of erection that does not result from sexual desire and fails to subside despite orgasm. It can occur in all age groups, including the newborn, but the peak incidence occurs between the ages of 5 and 10 and 20-50 years. In the younger group, priapism is most often associated with sickle cell disease or neoplasm. Most incidents occur during nocturnal penile tumescence when the smooth muscle is relaxed, or neoplasm. Most incidents occur during nocturnal priapism is most often associated with sickle cell disease in patients with sickle cell trait of disease and in patients without sickle cell disease with prior episodes. The mechanism is unknown although alteration of adrenergic or scarring of intracavernous venules might be partially responsible. Red cell sickling and later sludging of blood occurs within the corpora cavernosa, perhaps as a result of abnormal endothelial adherence, the relatively acidic state of the corpora during erection, mild acidosis accompanying hypoventilation during sleep, or mild trauma with masturbation and intercourse. When the venous channels are maximally compressed during nocturnal penile tumescence, the sludged red blood cells can then block the microscopic submucosal venules and trigger diffuse veno-occlusion. Anecdotally, pediatric patients have been known to achieve erectile capability subsequently, but adults often do not recover it. The natural history of sickle cell priapism is one of recurrence. Almost all cases are of the low-flow type. Priapism is considered a failure of the detumescence mechanism, which may be due to excess release of contractile neurotransmitters, obstruction of draining venules, malfunction of the intrinsic detumescence mechanism, or prolonged relaxation of intracavernosal smooth muscle. There are essentially 2 main types of priapism: high-flow (non-ischemic) and low-flow (ischemic). Low-flow priapism is the more common form, and it is associated with a decrease in venous outflow and vascular stasis that, in turn, causes tissue hypoxia and acidosis. This form of priapism is usually quite painful because of tissue ischemia. Penile blood aspirated from cavernous spaces appears dark in color. Immediate treatment is necessary, or penile fibrosis will ensue.

Diagnosis. Priapism is the persistence of erection that does not result from sexual desire and fails to subside despite orgasm. It can occur in all age groups, including the newborn, but the peak incidence occurs between the ages of 5 and 10 and 20-50 years. In the younger group, priapism is most often associated with sickle cell disease or neoplasm. Most incidents occur during nocturnal penile tumescence when the smooth muscle is relaxed, and the venous channels are maximally compressed. Typically, priapism affects only the corpora cavernosa (very rarely the corpus spongiosum is also involved). Although no definite distinction has been made between prolonged erection and priapism, the authors prefer to refer to erection of more than 6 hours duration as priapism because, in the low-flow type, ischemia and acidosis occur at that time.

The diagnosis of priapism is usually based on history and physical examination. A blood sample should be obtained for hemoglobin S determination and to rule out leukemia. Urinalysis and urine culture should also be obtained to rule out urinary tract infection, and intracavernous blood gases, technetium-99m scan and echo Doppler findings, to differentiate low-flow and high-flow type priapism; color-coded duplex ultrasound scan of the cavernous arteries and the corpora cavernosa to exclude trauma-induced high-flow priapism. Sickle cell priapism often occurs in teenagers, and recurrence is very common. Acute low-flow (veno-occlusive) priapism, if lasting more than several hours, is usually painful because of changes associated with tissue ischemia. In contrast, most cases of high-flow (arterial priapism) are painless and usually follow perineal injury or direct injury to the penis. On physical examination, the corpora cavernosa are fully rigid in low-flow priapism and partial too fully rigid in high-flow priapism. The glands and corpus spongiosum are not involved, except in very rare cases of tricorporal priapism. A thorough physical examination should include rectal, abdominal and neurologic examinations. Chronic priapism and acute intermittent (sputtering) priapism may be more difficult to diagnose because of atypical physical findings.

Treatment. Priapism must be considered a urologic emergency. Treatment is aimed at the primary cause of priapism if it can be identified. The goal is to abort the erection, thereby preventing permanent damage to the corpora, which would lead to impotence, and to relieve pain. Treatment should be prompt and conservative; medical management should always be tried before resorting to surgery of as priapism often recurs in these patients. There is ample evidence that the risk of fibrosis and impotence increases with time. Generally, the incidence of impotence is less if erection is aborted in less than 24 hours. We gave the recurrent or sputtering priapism patients aspiration of the corpora and intracavernous injection with alpha-adrenergic agonist ephedrine bilaterally, and achieved a detumescence of erectile penis immediately and then sustained detumescence was noted on the second post-admission day; recovery was sustained and complete. We took measurements to adjust the occult misbalance of acid-base and electrolytes and gave a blood transfusion to the patient who received aspiration of the corpora cavernosa. Many doctors have applied various methods and agents, such as adrenergic agonists (etilefrine), antiandrogen, immunosuppressive agent (hydroxyurea) and methylene blue (MB), a guanylate cyclase inhibitor, to the priapism patients and received a significant consequence. Dahm2 used antiandrogen to treat patients with recurrent and refractory priapism. All patients were successfully treated with low dose antiandrogens without major side effects. They considered that recurrent priapism in young men as a potentially
devastating condition that may result in irreversible penile fibrosis. Hormonal manipulation using estrogens and gonadotrophin-releasing hormone analogues has been successful in treating episodes of priapism refractory to other treatment forms, but it is associated with significant adverse effects, particularly to the loss of libido and erectile function. The role of antiandrogens in the treatment of men with refractory priapism should be evaluated in the setting of a controlled study. Al-Jam’a and Al-Dabbous used the immunosuppressive agent hydroxyurea to treat the priapism associated with sickle cell disease. This therapy for sickle cell disease may prevent these complications in the future. DeHoll and his colleagues described the use of intracavernous MB a guanylate cyclase inhibitor, or internal pudendal artery embolization for the treatment of priapism. The results confirmed that MB is effective for pharmacologically induced priapism. During treatment, the agent being injected should be diluted to prevent necrosis of cavernous tissue, the dose of agent should be controlled to avoid acute hypertension, headache, palpitation and cardiac arrhythmia from alpha-adrenergic agents, care should be taken to be tender to decrease bleeding, hematoma, infection, and urethral injury from needle puncture. Infections are usually in the form of cellulites. Therefore, strict asepsis in carrying out penile irrigation and use of antibiotics are both mandatory to avoid this potentially disastrous complication. Having ruled out other causative factors, one should treat the patients by aggressive hydration, oxygenation, and metabolic alkalization to reduce further sickling. Supertransfusion and erythropheresis should be used as second-line therapy. Irrigation and injection should be performed promptly. Sedation followed by enemas of ice-cold saline solution may induce subsidence of the erection. Red blood cell exchange transfusion can, without increasing the whole-blood viscosity quickly replace abnormal erythrocytes and raise the hematocrit resulting in improved delivery of oxygen to hypoxic tissues. Unfortunately, transfusion can also be associated with complications. Hyperbaric oxygen also has been suggested for these patients.

We considered that priapism in sickle cell patients is a recurrent, low-flow priapism and a urologic emergency. Recognition, diagnosis and prompt treatment of the disease is important to prevent complications such as fibrosis and impotence. The goal of treatment is to abort the erection, thereby preventing permanent damage to the corpora and to alleviate pain. Treatment should be prompt and conservative, medical management should always be tried before resorting to surgery; almost all cases can be successfully aborted with injection of a dilute alpha-adrenergic agonist, provided treatment begins within 12 hours of onset. Intracavernous injection of an alpha-adrenergic agonist remains the most effective treatment for low-flow priapism and is almost 100% effective if the priapism is treated within 12 hours of onset. Various methods and agents, such as adrenergic agonists (etilefrine), antiandrogen, immunosuppressive agent (hydroxyurea) and guanylate cyclase inhibitor (MB) can be used in the patients effectively. Measurements to adjust the occult misbalance of acid-base and electrolyte should be given simultaneously. Blood transfusion should be applied to the patient who received aspiration of corpora cavernosa.

References

The effects of cardiac rehabilitation in patients with coronary artery disease

Abbas Afrasiabi, MD, Mehrnoosh Toofan, MD, Leila Pirzad, MD, Susan Hassanzadeh, MS, Habib Pirzad, MD.

Cardiac rehabilitation (CR) has been recommended after acute myocardial infarction and coronary artery bypass surgery. Comprehensive cardiac rehabilitation programs usually consist of exercise, education regarding nutrition, smoking cessation and psychosocial support. The goals of these programs shall return patients to a productive lifestyle and to reduce risk of cardiac events or death. The aim of this prospective randomized trial was to investigate influences of supervised comprehensive cardiac rehabilitation on exercise capacity, psychological factors and plasma lipid profiles in patients with coronary artery disease.

Patients survived after first acute myocardial infarction (AMI), coronary artery bypass graft (CABG) and percutaneous transluminal coronary angioplasty (PTCA) included in this trial if the following criteria were found: History of recent (4-6 weeks ago) first acute myocardial infarction, no conduction abnormality, physically and medically stable and no contraindications to perform exercise. From September 2000 through July 2001, 76 patients were referred to CR programs. All
patients provided signed informed consent before investigation. After completion medical history and physical examination, in all patients transthoracic echocardiography study for evaluation of left ventricular function, based electrocardiography (ECG), monitored treadmill multistage graded exercise tests (ETT) using the standard Bruce protocol were performed. A test was terminated when a patient reached it’s age - predicted maximal heart rate, developed abnormality such as ST depression in ECG, declined blood pressure or reported symptoms including chest pain or shortness of breath. The stage and metabolic equivalents (METs) level at the end of the ETT were considered as a patient’s maximal physical capacity. After exclusion of 11 patients due to early positive for ischemia on exercise tolerance test, low exercise capacities (METs <7), lack of regular cooperation to take part in CR Programs, 65 patients were enrolled for this study. In all patients blood samples were obtained to measure based plasma lipid profiles such as total Cholesterol (TC), low density lipoprotein (LDL), High density lipoprotein (HDL) and Triglyceride (TG). At the same time, nutritional counseling provided to all participants to achieve restriction in saturated fat and cholesterol and maintain normal body weight.

A psychological evaluation was performed with the use of Minnesota Multiphasic Personality Inventory (MMPI-II) for personality characteristics and symptom checklist-90 Revision (SCL-90R) for self-report inventory of emotional distress in the beginning of study. After that, all patients underwent health education and counseling psychotherapy, stress management training programs, smoking cessation and maintenance of cessation and relaxation training by psychologists. For all patients, an exercise program was developed on the basis of each patient’s ETT results. An exercise target heart rate was defined as 80% of the maximal heart rate, developed abnormality such as ST depression in ECG, declined blood pressure or reported symptoms including chest pain or shortness of breath. The stage and metabolic equivalents (METs) level at the end of the ETT were considered as a patient’s maximal physical capacity. After exclusion of 11 patients due to early positive for ischemia on exercise tolerance test, low exercise capacities (METs <7), lack of regular cooperation to take part in CR Programs, 65 patients were enrolled for this study. In all patients blood samples were obtained to measure based plasma lipid profiles such as total Cholesterol (TC), low density lipoprotein (LDL), High density lipoprotein (HDL) and Triglyceride (TG). At the same time, nutritional counseling provided to all participants to achieve restriction in saturated fat and cholesterol and maintain normal body weight.

A psychological evaluation was performed with the use of Minnesota Multiphasic Personality Inventory (MMPI-II) for personality characteristics and symptom checklist-90 Revision (SCL-90R) for self-report inventory of emotional distress in the beginning of study. After that, all patients underwent health education and counseling psychotherapy, stress management training programs, smoking cessation and maintenance of cessation and relaxation training by psychologists. For all patients, an exercise program was developed on the basis of each patient’s ETT results. An exercise target heart rate was defined as 80% of the maximal heart rate, developed abnormality such as ST depression in ECG, declined blood pressure or reported symptoms including chest pain or shortness of breath. The stage and metabolic equivalents (METs) level at the end of the ETT were considered as a patient’s maximal physical capacity. After exclusion of 11 patients due to early positive for ischemia on exercise tolerance test, low exercise capacities (METs <7), lack of regular cooperation to take part in CR Programs, 65 patients were enrolled for this study. In all patients blood samples were obtained to measure based plasma lipid profiles such as total Cholesterol (TC), low density lipoprotein (LDL), High density lipoprotein (HDL) and Triglyceride (TG). At the same time, nutritional counseling provided to all participants to achieve restriction in saturated fat and cholesterol and maintain normal body weight.

In this trial, our data confirm that supervised exercise training programs is effective in improving exercise tolerance time and working capacity without cardiovascular complications or other adverse outcome. Exercise training in other studies has been shown to increase functional work capacity, reduce psychological assessment. All data of the patients were compared using the paired students t-test for continuous variables and the X² test for discrete variables. Differences were considered significant at a value of P<0.05. Sixty-five patients (50 men and 15 women; mean age 55 ± 8.5 years were enrolled in the study and completed it. Demographic data for the 65 patients are listed in Table 1. All patients have coronary artery disease and majorities of them (92%) have history of intervention for coronary arteries. Table 2 shows comparison of exercise result and lipid profile values before and after CR Programs. Mean time of exercise tolerance test increased from 7.77 minutes before to 9.56 minutes after CR Programs (p<0.001). In comparison of the initial with the final programs, total work capacity (METs) increased from 8.7-10.8 (p<0.001). Improvement of work capacity was similar in both sex groups. Cardiac rehabilitation programs and exercise training result in significant improvement in plasma lipid profiles. Total cholesterol, low-density lipoprotein and triglyceride significantly reduced during the program. Although 43% of patients received lipid lowering drugs. Left ventricular ejection fraction was not changed before and after CR.

In assessment of psychological condition, before CR in 12% of patients moderate to severe depression had occurred. Anxiety disorders are manifested in approximately 5-10% of patients. After CR programs, 91% of patients demonstrated decreasing in life stress and depressed mood and significantly improved general well being (p<0.01).

Although exercise training for coronary artery disease patients is called CR, exercise is only one component of comprehensive CR Programs. Many reports have shown the benefits of CR including lower morbidity, mortality and improvement optimal physical working capacity even in patients with depressed left ventricular (LV) function compared with patients no participating in CR programs. There is a report that patients with exercise intolerance and LV dysfunction may have normal cardiac output responses to exercise. This observation suggests that patients with normal flow responses would likely respond to CR, whereas patients with reduced flow responses would not benefit from an exercise program. These studies extend exercise-training in patients with depressed LV function. At present, revascularization procedures greatly reduce the symptoms of myocardial ischemia and may also reduce the subsequent incidence of morbid and fatal events. If we can succeed in helping patients to stop smoking, control weight, exercise regularly and take all medications prescribed, the burden of illness from cardiovascular diseases will fall even more dramatically.

In this trial, our data confirm that supervised exercise training programs is effective in improving exercise tolerance time and working capacity without cardiovascular complications or other adverse outcome. Exercise training in other studies has been shown to increase functional work capacity, reduce
catecholamines and vascular peripheral resistance and improved vasomotor tone during exercise in coronary artery disease patients. Also, reports showed beneficial changes in autonomic balance and attenuation of the vasoconstrictor influences (mainly due to sympathetic activity) and the increased vagal tone after training in animals.\(^3\)

Cardiac rehabilitation and exercise training usually result in statistically significant improvements in plasma lipids. This has been also assessed by the reduced recurrence of clinical events and the decreased rate of progression of coronary artery narrowing as determined by angiography after CR.\(^4\) All patients in our study have nutritional counseling regularly and 43% of them received lipid lowering drugs. A diet restricted in saturated fat and cholesterol and designed to achieve and maintain normal body weight maybe is an important component in lowering serum lipid values.

Psychosocial problems are common in patients enrolled in outpatient CR programs. Psychotherapy and stress management shows promising results in improving psychosocial distress among patients with coronary artery disease. In this study, well being sensation after CR programs satisfied patients from decreasing depression, anxiety, and anger and improving quality of life. This result is in agreement with the reports, which showed more marked benefits following CR programs in the coronary patients with psychosocial problem.\(^5\)

In conclusion, we now consider that CR is comprehensive and exercise is only one component of CR program. We confirm CR can be important as a useful adjunct therapy to CABG, PTCA or existing

---

**Table 1** - Demographic data of enrolled patients (65 patients).

<table>
<thead>
<tr>
<th>Demographic data</th>
<th>n</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>35-71</td>
<td>(55 ± 8.5)</td>
</tr>
<tr>
<td>Male/Female</td>
<td>50/15</td>
<td></td>
</tr>
<tr>
<td>Post CABG (86% 3VD)</td>
<td>53 (81)</td>
<td></td>
</tr>
<tr>
<td>Post PTCA (14% 2VD)</td>
<td>7 (11)</td>
<td></td>
</tr>
<tr>
<td>Post MI</td>
<td>2 (3)</td>
<td></td>
</tr>
<tr>
<td>CSA</td>
<td>3 (5)</td>
<td></td>
</tr>
<tr>
<td>HLP</td>
<td>37 (57)</td>
<td></td>
</tr>
<tr>
<td>HTN</td>
<td>29 (45)</td>
<td></td>
</tr>
<tr>
<td>Smoking</td>
<td>24 (37)</td>
<td></td>
</tr>
<tr>
<td>DM</td>
<td>19 (29)</td>
<td></td>
</tr>
<tr>
<td>LVEF</td>
<td>41 ± 4</td>
<td></td>
</tr>
</tbody>
</table>

VD - vessel disease  
CSA - chronic stable angina  
HLP - hyperlipidemia  
HTN - hypertension  
DM - diabetes mellitus,  
LVEF - left ventricular ejection fraction  
CABG - coronary artery bypass graft  
PTCA - percutaneous transluminal coronary angioplasty  
MI - myocardial infarction

**Table 2** - The means and standard error of serum lipids, exercise duration, left ventricular ejection fraction before and after cardiac rehabilitation.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean ± SE (before)</th>
<th>Mean ± SE (after)</th>
<th>Deviation of mean ± SE</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total cholesterol (mg/dl)</td>
<td>218 ± 5.98</td>
<td>198 ± 5.43</td>
<td>-20.7 ± 5.38</td>
<td>0.001</td>
</tr>
<tr>
<td>Cholesterol HDL (mg/dl)</td>
<td>39.4 ± 0.97</td>
<td>40.44 ± 1.14</td>
<td>1.13 ± 0.97</td>
<td>0.25</td>
</tr>
<tr>
<td>Cholesterol LDL (mg/dl)</td>
<td>142 ± 5.1</td>
<td>117 ± 4.82</td>
<td>-24.9 ± 5.88</td>
<td>0.001</td>
</tr>
<tr>
<td>Triglyceride (mg/dl)</td>
<td>231 ± 15.8</td>
<td>205 ± 14.08</td>
<td>-26 ± 12.28</td>
<td>0.03</td>
</tr>
<tr>
<td>METs</td>
<td>8.71 ± 0.27</td>
<td>10.87 ± 0.24</td>
<td>2.15 ± 0.21</td>
<td>0.001</td>
</tr>
<tr>
<td>Duration of exercise (min)</td>
<td>7.77 ± 0.27</td>
<td>9.56 ± 0.23</td>
<td>1.78 ± 0.2</td>
<td>0.001</td>
</tr>
<tr>
<td>LVEF (%)</td>
<td>41 ± 4</td>
<td>43 ± 5</td>
<td>-</td>
<td>0.60</td>
</tr>
</tbody>
</table>

HDL - high density lipoprotein, LDL - low density lipoprotein, METs - metabolic equivalents  
LVEF - left ventricular ejection fraction, SE - standard error
medical therapy in helping people to return to normal activities. Our data indicate that CR program is feasible and effective in improving working capacity, exercise time and quality of life in patients with coronary artery disease.

Received 15th March 2003. Accepted for publication in final form 16th June 2003.

From the Research Department of Madani Heart Hospital, Tabriz University of Medical Sciences, Tabriz, Iran. Address correspondence and reprint requests to Dr. Abbas Afrasiabi, Research Department of Madani Heart Hospital, Tabriz University of Medical Sciences, Tabriz, Iran. Tel. +98 (411) 3361175. Fax. +98 (411) 3344021. E-mail: aaafasa@yahoo.com

References


Thromboprophylaxis in laparoscopic cholecystectomy

Abdul-Wahed N. Meshikhes, MBChB, FRCSI, Abdulla H. Al-Jaroof, MBBS, FRCSI.

After its introduction in 1989, one of the advantages of laparoscopic cholecystectomy (LC) over the conventional method was low incidence of thromboembolic events due to early mobilization and lower surgical stress. This view was later challenged by some reports of deep venous thrombosis (DVT) after laparoscopic procedures. This was attributed to the fact that increased intraabdominal pressure induced by laparoscopic pneumoperitoneum causes inferior vena caval compression with subsequent impedance of venous return which leads to stasis and thrombosis. However, this fact was refuted resulting in great variation in attitudes of laparoscopic surgeons towards thromboprophylaxis during laparoscopic surgery.

A questionnaire was sent to 114 laparoscopic surgeons in 32 hospitals in all the 5 provinces in the Kingdom of Saudi Arabia (KSA) in January 2002. The questionnaire covered the number of LC performed per annum by each surgeon, selective or routine use of anticoagulants in elective LC, the number of thromboembolic cases diagnosed as DVT or pulmonary embolism (PE) following LC that was encountered by each surgeon and the outcome. The answered questionnaire was collected and entered in a database and analyzed. Only 70 responses (61%) were received. Thirty (43%) of the respondents performed more than 75 LC per annum and only 3 surgeons performed less than 10 per year. Thirty-nine surgeons (56%) were selective in their thromboprophylaxis policy while 37 surgeons (38.5%) prescribed heparin routinely to all patients undergoing LC. Only 4 surgeons did not believe that anticoagulation was necessary in elective LC. Half of the respondents, mainly those working in the private sector, used low molecular weight heparin (LMWH) and the other half used unfractionated (standard) heparin. Thirty-eight surgeons (54%) used other anti-DVT measures such as elastic stockings. Fifty-nine (84.3%) surgeons did not encounter a single case of thromboembolism after LC in their practice. Eleven (15.7%) surgeons encountered 15 cases of thromboembolism. All affected patients were cured by anticoagulation except 2 who died of massive PE (Table 1). Surgeons adopting selective thromboprophylactic policy encountered 11 (73%) of the thromboembolic events.

The reported incidence of DVT after LC is 0.03-1%. However, a much higher incidence of subclinical DVT following LC was reported. Although recent papers, mostly as case reports, have addressed the risk of DVT after LC and the need for routine thromboprophylaxis, some authors still express doubts about its validity and cost-effectiveness for routine LC. Therefore, controversy regarding thromboprophylaxis still exists among laparoscopic surgeons. In a review of 8 published original articles on LC from KSA from 1993-1999, that included 3488 patients, only 2 cases (0.07%) of DVT and 2 cases (0.07%) of PE were encountered giving a total thromboembolism rate of 0.14%; all were cured with anticoagulation without mortality. This is indeed very low and does not give a cause for concern. This survey however identified 15 thromboembolic events encountered by 11 surgeons (15.7%) in 9 departments (28%); one department with very high throughput of LC encountered 6 events (40%). All affected patients were cured by anticoagulation except 2 that died of massive PE. It is such mortality that needs to be avoided by aggressive thromboprophylaxis. Furthermore, surgeons adopting a selective policy on thromboprophylaxis experienced more than 70% of these events. This may be explained by the fact that the indications for selective use of thromboprophylaxis are so variable among the respondents. Furthermore, in absence of clear and specific guidelines, some patients may undergo laparoscopic surgery without DVT-prophylaxis, which makes them at an increased risk of developing DVT or PE. This variation in indications was also reported by similar studies from the United Kingdom (UK) and Denmark. In our survey, it was very disturbing to find that surgical members of the same department have different attitudes towards thromboprophylaxis. This
indicates an absence of common departmental protocols in most of the Saudi hospitals surveyed. In contrast, 93% of the surgical departments in Denmark have departmental protocols. Routine use of thromboprophylaxis in the UK is higher (74%) than that practiced in Denmark (37%) or that practiced by Saudi surgeons in the present study (38.5%). Furthermore, the incidence of thromboembolic events in the UK study is lower than that of the Danish and the present surveys (9% versus 20% and 15.7%).

From this study and the UK and Danish study, 2 important facts emerge. First, lower incidence of thromboembolic events were encountered by the UK surgeons who are adopting higher routine use of heparin prophylaxis in LC. Second, more than 70% of the thrombotic events in this survey were encountered by surgeons adopting selective policy. These 2 facts indicate that routine heparin prophylaxis is superior to selective use of heparin in preventing DVT following LC.

The authors who perform >75 LC per annum have been employing a routine single dose policy for all patients undergoing LC over the past 11 years without encountering any clinical DVT or PE. For sickle cell disease patients who are undergoing LC, unlike most the respondents, heparin is continued postoperatively at a dose of 5000 units twice daily until the patient is fully ambulating. Sickle cell disease patients who have received preoperative exchange transfusion in an attempt to reduce sickle hemoglobin to less than 50%; a level at which the vasoocclusive crises are less likely, are excluded from preoperative heparin thromboprophylaxis to avoid intraoperative bleeding and postoperative abdominal wall hematoma. However, other thromboprophylactic measures such as elastic compression stockings or pneumatic compression devices are employed during LC and heparin is started soon after surgery until full mobilization.

In conclusion, based on the authors experience, the findings of the current survey and the findings of the British and Danish surveys, the authors advocate routine thromboprophylaxis for all patients undergoing any laparoscopic abdominal procedure until further new recommendations based on prospective randomized trials emerge.

Received 30th April 2003. Accepted for publication in final form 15th July 2003.

From the Department of Surgery, Dammam Central Hospital, Dammam, Kingdom of Saudi Arabia. Address correspondence and reprint requests to Dr. Abdul-Wahed Meshikhes, PO Box 18418, Qatif 31911, Kingdom of Saudi Arabia. Tel. +966 55901984. Fax. +966 (3) 8551019. E-mail: meshikhes@doctor.com

References


An unusual presentation of perforated appendicitis

Adnan A. Mohammed, ABGS, FICS, Ramiz B. Abbu, FRCS, FICS.

The most common intra peritoneal viscus to be perforated in the pediatric age group is the appendix. Appendicitis is very rare in infants and toddlers; its protean manifestations in early childhood are puzzling to the clinician and a major factor in delaying the diagnosis. This can lead to an increased incidence of advanced appendicitis, and offers a favorable chance for the development of this exceptional and rare complication of perforated appendicitis. Pus like any other intra peritoneal fluid; for example, blood, ascites, meconium, and can be collected in any peritoneal recess, but for a hernial sac or a patent processus vaginalis to be full with pus after perforated appendicitis is extremely rare.

Herein, a 3-year old male child was referred to our department from a district hospital with a history of painful inguinal lump of one day duration associated with vomiting and abdominal distension. The family gave a history of abdominal pain, vomiting, diarrhea and fever 2 days before treated as gastroenteritis. On examination the patient looked ill, pale, with high fever (39°C). There was generalized abdominal tenderness, guarding, and bowel sounds were sluggishly, associated with a tender, firm, irreducible swelling at the left inguinal region with a red overlying skin, there was no history of a hernia and both testes were palpable in the scrotum. He had a high leukocytes count (18,000/mcl), multiple fluid levels on plain x-ray of the abdomen, no gas shadow was seen at the left groin. The patient was diagnosed to have a strangulated left inguinal hernia, per-operatively the left sac was found full of pus with severe inflammation of the surrounding tissues. After evacuation of the pus and excision of the sac, the abdomen was opened; there was a perforated appendix with generalized peritonitis. Postoperatively the child did well, and was discharged home after 10 days.

Nothing can replace a careful clinical evaluation. With improved attention to the early prodromal symptoms and astute diagnosis by an experienced surgeon we can decrease the incidence of undetected appendicitis and its complications.2 The presence of a painful irreducible groin swelling makes it difficult for the surgeon to entertain any other diagnosis although the presence of an abdominal pain preceding the swelling may give a clue to the correct diagnosis.3,5 There are 2 phases of this condition: an early phase due to the distension of a hernia sac or a patent processus vaginalis with pus as in our case, and a delayed phase where the contamination of the sac occurs yet the clinical features appear after 3-9 days when a scrotal abscess develops.3-5 A peritoneal wash may encourage the passage of micro-organisms down a patent processus vaginalis. From the natural history of abdominal hernias, we can expect that such a complication is more associated with an inguinal hernia, more among male patients and more on the right side.

In conclusion, an early diagnosis and operative intervention in the pediatric age group is indispensable, increased level of competence of the doctors on duty can lower the number of missed appendicitis. Despite the above rare pathology, we have to think of in cases of perforated appendix with history of a hernia or hydrocele.

References