

## Results of post-laparoscopic cholecystectomy duplex scan without deep vein thrombosis prophylaxis prior to surgery

Mohammad Ali Pakaneh<sup>1</sup>, Abdolreza Pazouki<sup>2</sup>, Zeinab Tamannaie<sup>3</sup>,  
Mohammad Hakimian<sup>4</sup>, Hamid Reza Zohrei<sup>5</sup>, Shahla Chaichian<sup>6</sup>

*Department of Laparoscopic Surgery, Minimally Invasive Surgery Research Center, Tehran University of Medical Sciences, Tehran, Iran.*

Received: 14 February 2012

Revised: 1 July 2012

Accepted: 8 August 2012

### Abstract

**Backgrounds:** There are controversies among surgeons about prophylaxis of deep vein thrombosis (DVT) in laparoscopic cholecystectomy. The aim of this study was the assessment of patients' condition after laparoscopic cholecystectomy without any prophylactic measure.

**Methods:** 100 cases of laparoscopic cholecystectomy without DVT prophylaxis were followed by duplex scanning in the first postoperative day and by physical examination and patient history at the first to second postoperative week however no clinical sign was found for DVT.

**Results:** Only one case of partially thrombosis (1%) was found by duplex scanning which was managed conservatively.

**Conclusion:** Laparoscopic cholecystectomy may consider as a low-risk procedure and routine prophylaxis may not be justified in the absence of other risk factor.

**Keywords:** Deep vein thrombosis, Laparoscopy, Cholecystectomy, Duplex scan.

### Introduction

There are controversies among surgeons regarding deep vein thrombosis (DVT) prophylaxis in laparoscopic cholecystectomy. Many surgeons have the same opinion for prophylaxis because of an increased intraperitoneal pressure caused by the laparoscopic surgery leading to an induced pneumoperitoneum. In addition, this condition reduces lower limb venous blood flow

significantly (1), which is an extra risk factor for deep vein thrombosis. DVT occurs mostly in the first post-operative 2 weeks (1). However, some surgeons disagree based on clinical signs and symptoms which found it as a low risk procedure.

The purpose of this study was to determine the incidence of clinically detectable DVT in patients undergoing laparoscopic cholecystectomy without a standard DVT prophylaxis regimen before surgery.

1. Fellowship of Laparoscopic Surgery, Minimally Invasive Surgery Research Center, Tehran University of Medical Sciences, Tehran, Iran. pakaneh@tums.ac.ir
2. (**Corresponding author**), Assistant professor of laparoscopic surgery, Minimally Invasive Surgery Research Center, Tehran University of Medical Sciences, Tehran, Iran. research@lapsurg.ir
3. General Practitioner, Minimally Invasive Surgery Research Center, Tehran University of Medical Sciences, Tehran, Iran. zeinabtamannaie@yahoo.com
4. Oncologic Surgeon. mhakimian@yahoo.com
5. Radiologist. zohrei@yahoo.com
6. Associated professor of gynecology fellowship of laparoscopic surgery, Minimally Invasive Surgery Research Center, Tehran University of Medical Sciences, Tehran, Iran, Islamic Azad University, Tehran Branch. shahlachaichian@yahoo.com

### Methods

In a prospective cross-sectional study, 100 candidates for laparoscopic cholecystectomy were studied. The patients did not receive any kind of DVT prophylaxis. Laparoscopic cholecystectomy was done without any intraoperative cholangiography in patients. None of the cases were opened because of complications. Duplex scanning was performed by a group of experienced dedicated sonographers on the first day after operation. Clinical follow up was done in the following two weeks after surgery for signs and symptoms of DVT. Statistic analysis was performed by SPSS v.13 for Windows. The quantitative data were expressed as mean  $\pm$  standard deviation (SD), and frequency used for analysis of the qualitative data.

### Results

Ten male and 90 female patients with mean age of 48.68 ( $\pm$  4.14) years were studied. All of the duplex scans were negative for DVT except in a 73-year old female who had partial thrombosis in the right femoral and popliteal veins. She did not have any DVT sign or symptom and received no treatment; hence she was discharged in the second day of operation in a well condition. In the further 10 and 30 days clinical follow-up, no sign or symptom of deep vein thrombosis or pulmonary emboli was found. One to 2 weeks after operation there was not any sign or symptom of DVT in other patients.

### Discussion

Three deaths due to pulmonary embolism have been reported in a retrospective survey of 77604 patients undergoing laparoscopic cholecystectomy (2). In another study, among 100 consecutive patients who intended to undergo cholecystectomy, two patients showed postoperative DVT including 1 patient after 59 laparoscopic and 41 mini-laparotomy cholecystectomy each, respectively. However, DVTs were detected by duplex examination on the first postoperative day. Therefore, despite the theoretical risk of thromboembolic disease due to laparoscopic pneumoperitoneum, the frequency

of DVT after either laparoscopic cholecystectomy or mini-laparotomy cholecystectomy was low. The low risk of thromboembolism occurs if adequate thromboprophylaxis regimen which is subcutaneous heparin 5000 units TDS and intermittent pneumatic compression were administered in the patients especially in the high risk ones (3).

Patel et al. reported 20 patients underwent elective or urgent laparoscopic cholecystectomy, in which all patients were given graduated compression stockings to wear and 16 received electrical stimulation of the calf during the operation. Only 16 patients received pharmacological thromboprophylaxis before the operation, but all patients received the drug after the operation. Eleven out of 19 patients completing all the required scans (venous duplex scan before the operation and on Day 1, 7 and 30 after the operation) developed venous thrombosis (incidence, 55%); none of the DVTs were suspected clinically (4). In a series of 438 laparoscopic cholecystectomies, thromboembolism has occurred in three: one DVT, one non-fatal pulmonary embolism, and one fatal pulmonary embolism. All three thrombotic cases were confirmed by phlebography or ventilation-perfusion scanning or after death (5).

It is also reported that 114 patients were randomized into two groups, in which 58 and 56 patients underwent laparoscopic and open cholecystectomy, respectively. None of the patients in either group received thrombosis prophylaxis. Postoperative DVT developed in four (6.9%) and nine (16.07%) patients in the first and second groups, respectively (6). Frequency of DVT was 2% in another study with 50 patients after laparoscopic cholecystectomy. All the patients had received thromboembolism prophylaxis and DVT was detected by bilateral phlebography 7-11 days after surgery (7).

The results of our study were different from aforementioned articles in some aspects. It is important for a clinical practitioner to consider the signs and symptoms further to paraclinic results. Hence in addition to para clinic assessment of DVT by Duplex scanning on the first day after operation, we

set up a clinical follow up in the following two weeks after surgery for signs and symptoms of DVT. Most of the mentioned articles relay on paraclinical findings.

Blake et al. performed laparoscopic cholecystectomy in 587 patients over a 4-year period. Eighteen patients received some form of perioperative DVT prophylaxis, while 569 patients did not. In the course of 4 weeks clinical follow-up, none of the 587 patients had symptoms of DVT or pulmonary embolism (8). In one report, no postoperative thrombi was diagnosed with duplex scanning during unspecified laparoscopic procedures in 61 patients and none of them received prophylaxis (9). It is important to consider some risk factors like body mass index and duration of surgery in further researches.

### Conclusion

In this study, laparoscopic cholecystectomy may be considered as a low-risk procedure for thrombosis, and therefore routine use of prophylaxis is probably not justified for all patients. However, more clinical trials or further studies are crucial and recommended for an exact approval of this idea.

### References

1. Jorgensen JO, Lalak NJ, North L, Hanel K, Hunt DR, Morris DL. Venous stasis during laparoscopic cholecystectomy. *Surg Laparosc Endosc.* 1994; 4:

128-133.

2. Millikan KW, Economou SG, Doolas A, Airan MC. Complications of laparoscopic cholecystectomy: a national survey of 4,292 hospitals and an analysis of 77,604 cases. *Am J Surg.* 1993; 165:9-14.

3. Reginald VN, Lord, Joycelyn J. Ling, Thomas B. Hugh, Maxwell J. Coleman, Bruce D. Doust. Incidence of deep vein thrombosis after laparoscopic vs minilaparotomy cholecystectomy. *Arch Surg.* 1998;133(9):967-973.

4. Patel MI, Hardman DT, Nicholls D, Fisher CM, Appleberg M. The incidence of deep venous thrombosis after laparoscopic cholecystectomy. *Med J Aust.* 1996; 164: 652-656.

5. Jorgensen JO, Lalak NJ, North L, Hanel K, Hunt DR, Morris DL. Thromboembolic complications of laparoscopic cholecystectomy. *BMJ* 1993;306:518-9

6. Milic DJ, Pejic VD, Zivic SS, Jovanovic SZ, Stanojkovic ZA, Jankovic RJ, Pecic VM, Nestorovic MD, Jankovic ID. Coagulation status and the presence of postoperative deep vein thrombosis in patients undergoing laparoscopic cholecystectomy. *Surg Endosc.* 2007 Sep; 21(9):1588-92.

7. Lindberg F, Björck M, Rasmussen I, Nyman R, Bergqvist D. Low frequency of phlebographic deep vein thrombosis after laparoscopic cholecystectomy-a pilot study. *Clin Appl Thromb Hemost.* 2006 Oct; 12(4):421-6.

8. Blake AM, Toker SI, Dunn E. Deep venous thrombosis prophylaxis is not indicated for laparoscopic cholecystectomy. *JLS.* 2001 Jul-Sep; 5(3):215-9.

9. Wazz G, Branicki F, Taji H, Chishty I. Influence of pneumoperitoneum on the deep venous system during laparoscopy. *JLS.* 2000; 4: 291-295.

10. David Bergqvist, Gordon Lowe. Venous Thromboembolism in Patients Undergoing Laparoscopic and Arthroscopic Surgery and in Leg Casts. *Arch Intern Med.* 2002;162(19):2173-2176.