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Research article

PCNL, Clotting Status and Bleeding Risk: Is Pre-operative Clotting Status Justified?

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Abstract

Introduction

Percutaneous nephrolithotomy (PCNL) demonstrates better results of stone clearance compared to ESWL or open stone surgery. Intraoperative and postoperative haemorrhage is a frequent complication. Transfusion rates of up to 34% have been reported. We aim to review this cohort to see if clotting status pre-procedure is required.

Patients and Methods

We conducted a retrospective analysis of 100 patients undergoing PCNL over the past year under a single surgeon (AD). We recorded pre-operative clotting status, post-operative haemorrhage, blood transfusion rate and complications. In addition, stent/ nephrostomy insertion, bleeding risk and length of stay was recorded.

Results

32% of procedures were done on the right, 68% on the left. 62% had a nephrostomy inserted post procedure, 6% had antegrade stents. Complete stone clearance was achieved in 72%. Bleeding risk was high in 2%. The mean length of stay was days 3.0 (range 1 - 9). Average pre-operative APTT ratio was 1.0 (range 0.9 - 1.2), the average INR was 0.9 (range 0.9 - 1.5). Average post-operative haemoglobin drop was 0.8. Post-operative haemorrhage requiring transfusion occurred in no patients. Complications included: blood clots/ minimal bleeding 6.0%, sepsis in 6%. None of these patients were re-admitted with haemorrhage.

Conclusions

We demonstrate that patients have no significant complications related to pre-operative clotting status. We concluded pre-operative clotting status is not required as routine before this procedure. Results are compared with other published data.

Keywords: Percutaneous Nephrolithotomy; Clotting Status Pre-Operatively

Introduction

Percutaneous nephrolithotomy (PCNL) monotherapy shows superior results in terms of stone clearance, cost-effectiveness, and also early postoperative convalescence when compared with shockwave lithotripsy (SWL) or open stone surgery [1-3].

PCNL monotherapy as the most effective approach to large volume renal stone disease with a superior overall stone-free rate of 78% [1]. Complication rates as high as 83% have been reported [4-6]. Intraoperative and postoperative hemorrhage is one of the most frequent complications associated with PCNL. Transfusion rates of up to 34% have been reported [8]. About 1% of all PCNL patients complain of delayed postoperative bleeding [7].

Both intraoperative and postoperative bleeding are a matter of concern for any patient undergoing PCNL. Kukreja et al [8] reported an 8% blood transfusion rate in 301 PCNL procedures in patients with normal clotting parameters, and Kessaris et al. reported a 0.8% incidence of post-PCNL bleeding requiring embolization [9]. We aim To investigate the intra- and postoperative hemorrhage of percutaneous nephrolithotomy via the standard nephrostomy tract.

Prior papers have demonstrated stone burden was the most influencing predictive factors for PCNL blood loss [10]. Amount of blood requested and cross-matched was found to be much greater than actual blood loss [10]. Even in patients with pre-operative clotting problems, with careful perioperative regulation of anticoagulation therapy and clotting parameters, percutaneous nephrostolithotomy can be performed safely and efficiently in properly selected patients requiring long-term anticoagulation [11].

Methods

A retrospective analysis was conducted among 100 patients undergoing percutaneous nephrolithotomy under a single surgeon (AD). During the operations, all the nephrostomy tracts were dilated with Amplatz to F24 size after successful puncture. The stones were shattered and removed by EMS lithotripsy system. We recorded pre-operative clotting status, post-operative haemorrhage, blood transfusion rate and complications. In addition, stent/ nephrostomy insertion, bleeding risk and length of stay was recorded.

Results

32% of procedures (16) were done on the right, 68% (34) on the left. 62% (31) had a nephrostomy inserted post procedure, 6% (3) had antegrade stents Complete stone clearance was achieved in (36) 72. All patients were stratified as normal clotting status. The mean length of stay was 3.0 days (range 1 - 9). Average pre-operative APTT ratio was 1.0 (range 0.9 - 1.2), the

average INR was 0.9 (range 0.9 - 1.5)- all has normal pre-operative clotting status. Average post operative haemoglobin drop was 0.8. Post operative haemorrhage requiring transfusion occurred in no patients. Complications included: blood clots/ minimal bleeding (3) 6.0 %, sepsis in (3) 6% Clavien-Dindo grade 2 [12]. None of these patients were re-admitted with haemorrhage. No patients required a return to theatre.

Discussion

In addition to clotting status, adequate access is a key factor [13]. Whilst USS input has been shown to be part of this, surgeon experience is the core component to lack of complications [13]. Clinically significant bleeding can be treated conservatively in a majority of cases with tamponade nephrostomy tubes with or without transfusions [13]. Arterial hemorrhage, pseudoaneurysms, and arterial-venous fistulas, however, require prompt intervention with angiographic embolization [13].

Conclusions

We conclude according to risk stratification, patients have no significant complications related to pre-operative clotting status. Percutaneous nephrolithotomy through standard nephrostomy tract is safe and does not increase the risk of bleeding with careful operation.

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