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Blood Loss after Total Knee Arthroplast

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Introduction

Total knee arthroplasty is associated with considerable blood loss[1,2]. Various measures which reduce effective blood loss include use of tourniquet[3], minimally invasive surgery[4].use of cautery. Sealing of femoral canal[5], position of knee[6] and use of antifibrinolytic agents[7]

Aims and Objectives

The study was conducted at the Postgraduate Department of Orthopaedics; Government Medical College, Srinagar. Aim of the study was to evalvate blood loss in total knee arthroplasty using a standard conventional surgical procedure

Materials and Methods

The study was conducted at the Postgraduate Department of Orthopaedics; Government Medical College, Srinagar. After obtaining approval from Hospital Ethics Committee, a written informed consent was taken from the patients for participation in this study. The present prospective study consisted of a total of 25 cases of total knee replacement for symptomatic patients with primary osteoarthritis knee using posterior cruciate ligament substituting implant all patients requiring a unilateral primary TKA for osteoarthritis were considered for inclusion in thestudy. Those with a history of a bleeding diathesis, those in whom non-steroid anti-inflammatory medication was contraindicated and those taking warfarin were excluded. All patients had pre donated autologous blood for transfusion according to a pre-ordained schedule

Operative Procedure

The operations were performed by a single surgeon in one hospital using a uniform surgical approach, instrumentation, and technique and release sequence. The operations were carried out in a bloodless field using a pneumatic tourniquet at a pressure of 300 mmHg after exsanguination. A medial Para patellar approach was used through a midline skin incision. The length of the incision was identical in all cases with no attempt to perform minimally-invasive surgery. Bone cuts and soft-tissue balancing were done in the same sequence. Wound was closed in layers over suction drain Method of anaesthesia and thromboprophylaxis.

All patients received spinal or epidural anaesthesia. In all patients thromboprophylaxis consisted of 10 mg of rivaroxaban once daily post-operatively for two weeks and the wearing of thromboembolic stockings.

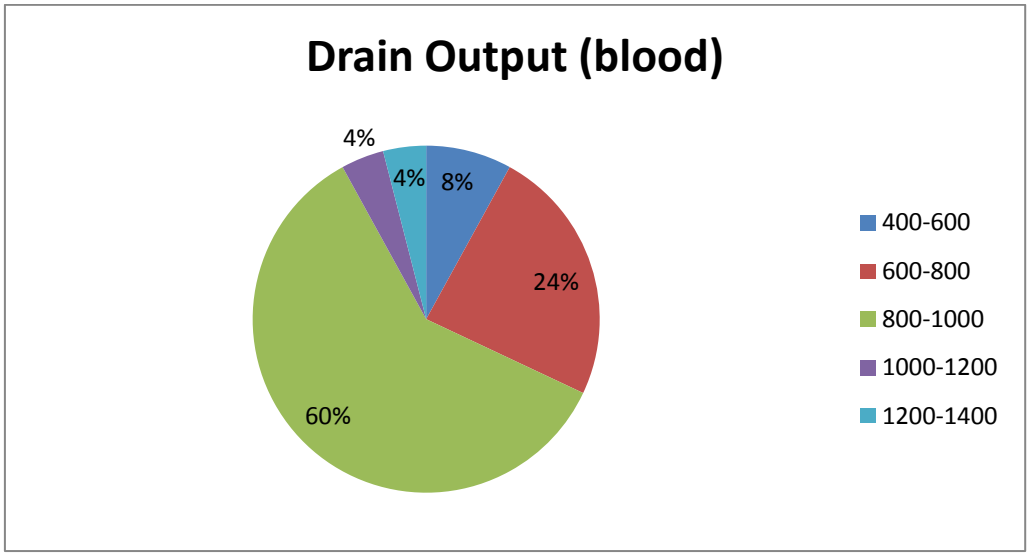
Blood transfusions and post-operative managemen

All patients were routinely transfused with between one and two units on the anaesthetist's assessment of each patient's haemodynamic parameters. Further units were given as necessary according to the volume in the drains and the clinical status. Patients followed a standard post-operative rehabilitation including immediate post-operative continuous passive movement and physiotherapy. The volume in the drains was recorded and the drains were removed on the second day after surgery. This was the primary outcome measure.The Hb level was measured in all patients in the week preceding surgery and on the second post-operative day. Calculation of the loss of Hb level was carried out, as a secondary outcome measure, by subtracting the post-operative from the pre-operative Hb level and adding the number of units transfused [8-10]
as follows: Total Hb loss = Pre-Hb - Post-Hb + units transfused (assuming 1 unit of blood = 1 g/dl)

Observations and Results

Table 8 Drain Output

Drain Output (Ml)	Frequency	Percent
400 -600	2	8%
600-800	6	24%
800-1000	15	60%
1000-1200	1	4%
1200-1400	1	4%



The mean drain output in our study was 806 ml . Tourniquet was removed at the end after closure of wound and application of compression

Discussion

STUDY	Cem Coskun et al (2013)[11]	Roysam et al (2001)[12]	Y. Kalairajah, Simpson et al (2006)[13]	Present Study
BLOOD LOSS (mean)	1125ml	748ml	1747ml	806ml

Total knee arthroplasty is a major orthopaedic surgery that involves considerable blood loss because of the extensive soft tissue release and bone cuts that are performed.[1,2]

The amount of blood loss in a primary, cemented total knee arthroplasty seems to be subject to wide variations, as seen in the reported literature from different parts of the world.[11-13]

The mean blood loss post-operatively (drain output) in our study was 806 ml.

Kalairajah et al, in their study comparing blood loss in computer assisted versus standard procedure for a total knee arthroplasty returned a mean of 1351 mL in the computer-assisted group versus 1747 mL in the conventional group. This study used a technique similar to ours where they released the tourniquet only *after* the wound was closed and crepe bandage dressing was applied.

Cem Coskun, et al, in their study evaluating the differences between the standard parapatellar approach and the minimal invasive midvastus approach found that the blood loss in their standard group was 1125mL.

Another study by Roysam et al, showed a mean total blood loss of 748 mL.

These examples from the available literature point towards the wide variations in the reported blood loss following total knee arthroplasty.

Still, our present study is comparable to most of the studies that have documented blood loss.

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