

TKR SURGERY WITHOUT BLOOD TRANSFUSIONS

Use of one low capacity *subcutaneous* suction drain or *no* drains associated with *moist* dressings, continuous cryotherapy and effective elevation

- J. DINIS CARMO, MD -

INTRODUCTION

Most surgeons performing TKRs request the use of blood transfusions during or after TKR surgery. They also use routinely one or two deep high capacity suction drains. It is our belief that both factors are related, as the continuous suction leads to increased blood loss with subsequent need for blood transfusion, creating a vicious cycle. Since 1999, during our routine uncomplicated TKR surgery we stopped using such drains.

We currently perform our surgery with an applied thigh tourniquet and no drains or only a subcutaneous, low capacity, low flow drain is used. After we adopted this procedure, no patient was ever transfused intra or post-operatively. Blood reserves are not ordered. Advantages include elimination of blood transmitted infection or diseases, easier nursing care, faster rehabilitation, and economical gains in blood units and drain systems.



Material
100 Osteoarthritic patients
Uncomplicated primary TKR
Follow-up: ≥ 4Y



Pre-op blood values

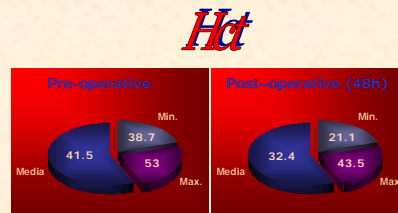
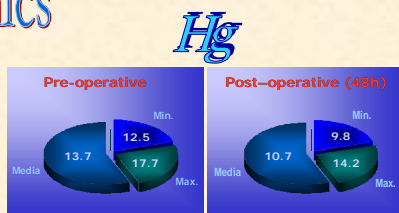
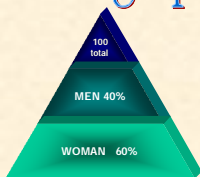
Hg. ≥ 12.5 g/l
Hct. ≥ 38.7%



Relevant Intraoperative Techniques

- Pneumatic tourniquet applied over soft dressing, NOT released intra-operatively
- Medullary femoral canal obstructed with haemostatic sponge
- Interrupted sutures used in all planes
- NO drains or
- Single, extra-articular (subcutaneous), low capacity, low velocity drain (mainly female, obese, cellulitic patients)

demographics



Female	60%
Male	40%
Oldest patient	81 yrs
Youngest patient	51 yrs
Media Age	68 yrs

MEDIAN DROP IN BLOOD VALUES in the 1st 48h	
Hg	↓ 3.7
Hct	↓ 12.2

Relevant Post-Operative Techniques

Moist Robert-Jones type dressings starting at the foot Continuous Cryotherapy for 24-48h Effective Elevation Early Mobilization; no CPM



Moist dressings promote capillary suction of wound bleeding. In combination with continuous cryotherapy, skin temperature is lowered and compression of the dressings is more even and uniform. After drying, the cotton becomes firm, almost card-board like, forming a "mold" of the extremity that seems to have just the appropriate characteristics to minimize post-operative oedema and pain.



Both undispensable to life but not exactly equal

One of the most important characteristics of blood is its ability to clot, but you must give it a chance...

If blood keeps being actively sucked by whatever mechanical means clotting is not possible and the wound will keep oozing.

RESULTS



A soiled post - 24h dressing, but a painless limb with negligible swelling.

In this case, one 300 cc subcutaneous drain was used which almost filled...



If surgery is performed in the morning, by the end of the day the patient is allowed to sit and flex passively. Close to 90° are generally achieved. In this case, the drain was removed after the initial mobilization. The next day the patient is allowed a short walk with a walking frame.

The patient is advised pre-op. that significant, clinically inconsequential ecchymosis may occur post-operatively.



Conclusions

NO COMPLICATIONS RELATED TO THE DESCRIBED TECHNIQUES WERE OBSERVED.

There were no confirmed:

- Intra-articular significant haematomas
- Clinically significant post-op DVT
- Wound healing related problems
- Confirmed cases of post-op infection. One case has undetermined post-op knee pain

ECONOMIC SAVINGS related to avoidance of blood testing, reserve units, and drain systems were significant

Of great importance:

BLOOD LOSS was still *significant*, averaging 3.7 Hg and 12.2 Hct values. Theoretically, this corresponds to about 2-3 units of blood loss.

Therefore:

- Pre-operative Hg and Hct values must be within normal values
- Pos-op. blood values must be checked. Hg and HCT values tended to keep dropping during the first week post-op.

ESR was monitored until normal.

Oral iron and vitamin supplements were routinely prescribed.

Contrary to some reports, especially in our early cases, we had an increase in post-operative subcutaneous ecchymosis. Factors contributing to differences between early and late cases may include:

- We started using subcut. drains in selected cases,

and

- The elusive but well known fact that results tend to get better with experience.

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