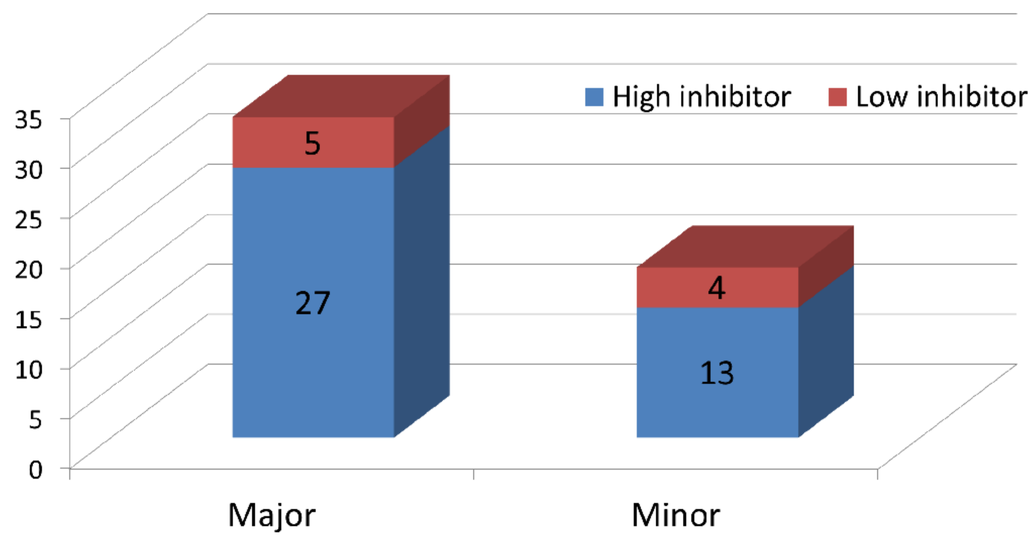
Experience of surgery in patients with haemophilia with inhibitors

Scientific Center for Haematology, Moscow, Russia
Polyanskaya T, Zorenko V, Karpov E, Sadykova N, Vasiliev D, Pisecky M, Sampiev M, Mishin G, Terechov A

We present our clinical experience of 49 orthopaedic surgical procedures in ininhibitor patients during last 10 years. There were 32 major surgeries and 17 minor surgeries **(Fig.1)**. All patients had severe hemophilia A. Forty of the patients had a high inhibitor titre (from 5 to 463 IU), among whom were fifteen with knee replacement, one with hip replacement, four with pseudotumour removal, three with osteosynthesis of the left femur with a Dynamic Hip Screw (DHS), two with amputation of the leg, two with corrective hip osteotomy, one with achilloplasty and twelve with sinoviorthosis with rifampicin. All surgical procedures were performed by standard conventional methods.

Fig. 1. Number of orthopaedic surgicals at patients with high and low inhibitor



Two major types of musculoskeletal surgery were performed in the patients with haemophilia with inhibitors: joint surgery and extra-articular surgery. Most (65%) of the surgeries conducted were major surgical procedures.

All the inhibitor patients in our centre received haemostatic therapy with rFVIIa immediately before and during orthopaedic surgery at 120 mg/kg every 2 h or FEIBA 50-60 IU/kg every 12 h. The rFVIIa dose was then reduced to 100 mg/kg every 3 h on Day 2 and 90 mg/kg every 3 h from Day 3 until the end of the catabolic phase. None of the patients experienced re-bleeding during this phase. During the anabolic phase (i.e. until major reparative processes in the damaged tissues were complete), patients who underwent high- and medium-risk surgical interventions received rFVIIa at a dose of 90 mg/kg every 4 h, with intervals gradually increasing to 6 h or FEIBA 50 IU/kg every 12-24 h. In all cases, rFVIIa and FEIBA provided effective haemostasis.

Patients with haemophilic arthropathy have progressive destruction of cartilage and bone components of joints also occur. All our patients were with Stage IV–V haemophilic arthropathy with the expressed changes of an axis of an extremity underwent total knee joint replacement (Fig. 2). Two of them had ankylosis of the affected joint. Blood loss in inhibitor patients who underwent arthroplasty of the knee with haemostatic rFVIIa or FEIBA therapy in our clinic was comparable to that in patients with classic haemophilia undergoing this type of intervention. In all cases of knee endoprosthesis good haemostasis was achieved. 2 patients required removal of his prosthesis 6 months and 1 year after knee endoprosthesis due to reactivation of endogenous infection following.

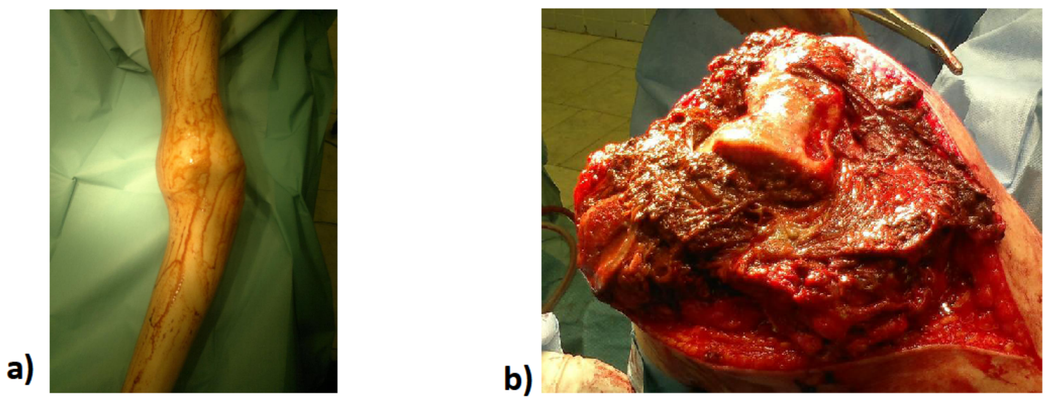


Fig. 2. Photograph of patient P. **a)** Appearance of the lower extremity, severe varus deformity of the limb at the knee joint; **b)** hemophilic arthropathy of knee joint of the IV stage, the joint surfaces are destroyed, absence of cartilage, chronic synovitis.

Patients received rFVIIa(NovoSeven® or Koagil-VII) or FEIBA as haemostatic therapy **(Table 1)**. Regimens of haemostatic therapy were depending on the type of surgery. The haemostatic efficacy of rFVIIa and FEIBA was evaluated based on clinical data (i.e. the volume of blood loss during the operation and in the postoperative period; development and volume of haematoma; and pain). In addition, inhibitor titre (BU) and FVIII concentration (%) were measured in all patients. In the early postoperative period, 35 patients received antibiotic therapy with broad-spectrum antibiotics to prevent surgical wound infection. Antifibrinolytic agents and heparin were not administered. Fourteen patients with chronic synovitis (knee n = 12, elbow n = 2) received intra-articular injections with rifampicin at a dose of 300 mg in the knee or 150 mg in the elbow. Treatment consisted of five injections at 7-day intervals.

Table 1. The orthopedic surgical interventions performed in haemophilia patients with inhibitors.

Type of operation	rFVIIa		FEIBA	Total
	NovoSeven®	Coagill-VII		
Sinoviorthosis with rifampicin	6	1	7	14
Corrective hip osteotomy	2		2	4
Osteosynthesis	2	1	1	4
Achilloplasty	1	1		2
Pseudotumour removal	4		1	5
Amputation of the leg	1	1		2
Knee replacement	8	6	2	16
Hip replacement		1		1
Arthroscopy	1			1
TOTAL	25	11	13	49

Arthropathy is the main, but not the only, long-term manifestation of haemophilia.

Pseudotumour complications can vary and depend on the localization of the pathological process. Surgical treatment of a pseudotumour should include total removal of its capsule and non-viable tissue, thus avoiding re-bleeding. Effective local haemostasis is an important step in pseudotumour extirpation. During the operation, we used local haemostatic therapies. Four inhibitor patients with a pseudotumour of the lower extremities (hip n = 4, knee n = 1) **(Fig.3)** underwent surgical pseudotumourr extirpation 4 with haemostatic rFVIIa therapy and 1with haemostatic FEIBA therapy. Four patients had a high inhibitor titre (>5 BU) and one low. In all cases, after pseudotumour extirpation, postoperative wounds were treated by a semi-open method through cavity squeezing with gauze tissue and antiseptic solution. The gauze was removed from the wound according to residual cavity reduction. In all cases of pseudotumour extirpation good haemostasis was achieved.

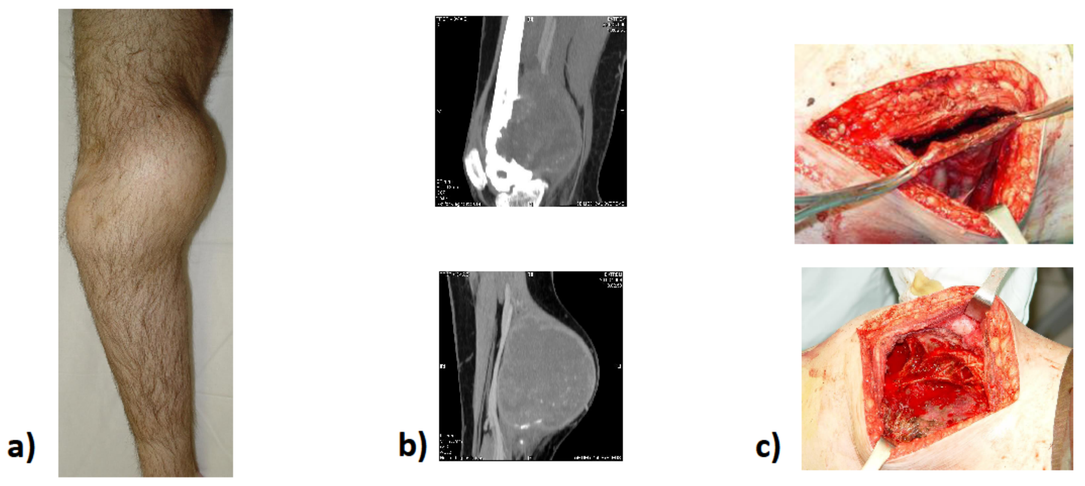


Fig. 3. Pseudotumor of the right knee in a patient with hemophilia A and high inhibitor titre. a) general view of the lower extremity with pseudotumor of knee and hip; b) CT: the destruction of the hip bone structures, pseudotumor directly adjacent to the neurovascular bundle; c) stages of the operation: the capsule pseudotumor, severe destruction of the femoral

In all cases of surgery achieved good haemostasis. 2 patients required removal of his prosthesis 6 months and 1 year after knee endoprosthesis due to reactivation of endogenous infection following. 14 patients with chronic synovitis received intra-articular injections with rifampicin, 1 patient with sinoviorthosis developed an intramuscular haematoma and 1 patient developed haemarthros.

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