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Case Report

Haemophilic arthropathy of the knee: a surgeon's nightmare

Mohammad Jesan Khan[1], Naiyer Asif[1], Yasir Salam Siddiqui[1], Mohd Hadi Aziz[1], Ariz Raza[2], Noor Alam[1]

[1]Department of Orthopaedic Surgery, JNMCH, AMU, Aligarh, Uttar Pradesh, India; [2]Department of Orthopaedic Surgery, Hamdard Institute of Medical Sciences & Research (HIMSR), New Delhi, India

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Abstract: Surgical management of knee synovitis secondary to mild haemophilia, without any significant previous medical history and an adverse family history of haematological disorders, is arduous. Due to its rare occurrence, the diagnosis is often delayed or sometimes missed, leading to the grave and often lethal consequences in intraoperative and postoperative periods. Hardly isolated knee arthropathy due to mild haemophilia has been reported in the available literature. In this report, we present the management of a case of a 16-year-old male with isolated knee synovitis with undiagnosed mild haemophilia, who came to us with the first episode of knee bleeding. We elucidate the signs and symptoms, investigations, surgical management, and difficulties faced, especially during the postoperative period. This case report is presented to enhance awareness of the existence of this disorder and its management to prevent postoperative complications.

Keywords: Diagnostic delay, arthropathy knee, mild haemophilia

Introduction

Haemophilia is a rare type of inherited coagulopathy characterized by the absence of clotting factor VIII (Haemophilia A) or clotting factor IX (haemophilia B). It is an X-linked recessive disease. However, some spontaneous mutations may occasionally occur [1]. The absence of these coagulation factors increases the susceptibility to excessive bleeding. Up to 80% of haemorrhages in ambulatory individuals arise in the form of hemarthrosis, which is bleeding into a joint [2, 3]. The joints that are most frequently afflicted in individuals who are not receiving prophylaxis are the knees (45%), elbows (30%), ankles (15%), shoulders (3%), and wrists (2%) [4], rest 20% occur in the central nervous system and other systems [5]. Haemophilia is a challenging disorder for orthopaedic surgeons because of the high involvement of the musculoskeletal system [1]. The average prevalence of haemophilia worldwide is 1/10,000 [6]. Its severity can be divided according to the blood levels of the coagulation factor in relation to normal: severe (<1% of normal), moderate (1%-5% of normal), and mild (>5% of normal) [1]. The likelihood of spontaneous bleeding and the onset of the first bleeding episode, which can start as early as birth, is higher in severe haemophilia. Following trauma, immediate and delayed bleeding is frequent; it can be massive or continue as continuous oozing for days or weeks [7, 8]. An invasive procedure frequently results in bleeding in patients with moderate haemophilia. Bleeding happens four to six times per year and is less frequent than severe haemophilia. On the other hand, people with mild haemophilia typically only bleed in response to trauma or surgery, and bleeding may not become clinically evident until later in life. Even in people with mild haemophilia, delayed bleeding can happen following minor surgical procedures like tooth extractions [7, 8]. Haemarthrosis, muscle haemorrhage, pseudotumors, joint arthropathy, deformities, and fractures are known musculoskeletal complications of haemophilia [1, 5, 6, 9]. Haemophilic arthropathy (also called haemophilic arthritis) refers to persistent joint disease, which develops as a result of repeated bleeding into joints; it is a devastating and frequent complication of severe (and, to a lesser extent, mild) haemo-

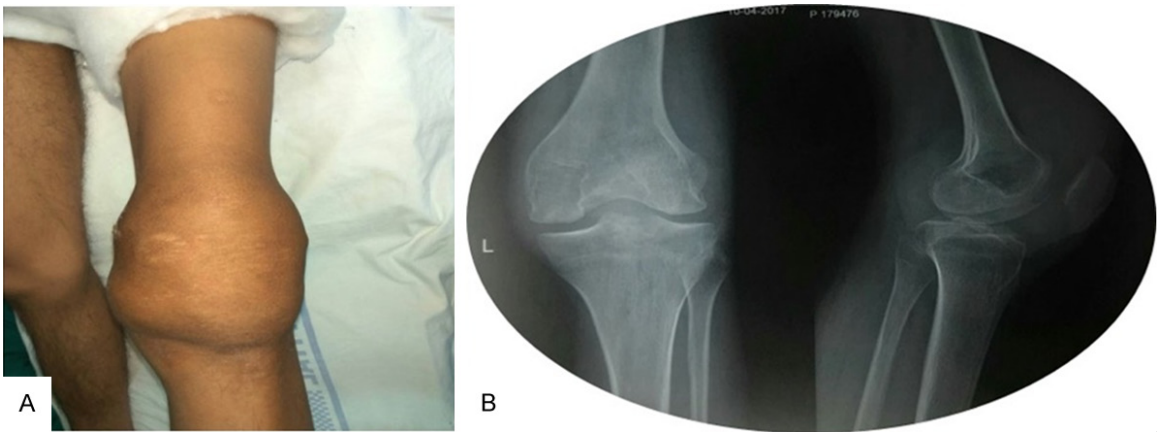

Figure 1. Showing diffuse swelling around the left knee (A) and an X-ray of knee anteroposterior and lateral view suggesting prominent soft tissue shadow, widening of intercondylar notch and areas of cortical scalloping suggesting chronic compressing changes (B).

philia [10]. Recurrent bleeding causes chronic synovitis, joint erosion, cartilage and bone degradation, synovial inflammation and hypertrophy, and dense fibrosis, all of which contribute to joint contracture and motion restriction [4]. By the time they are 20 to 30 years old, roughly 90% of haemophilia patients have one or more joints affected by proliferative and progressive degenerative articular changes [11]. Clinically, patients may present with painful, tender knee swelling, joint contractures, limited range of motion, and boggy synovial tissue that may be palpable in the suprapatellar region.

This report presents a case of knee synovitis in a patient with undiagnosed mild haemophilia that posed a management challenge to us. We could find only a handful of similar cases in the available literature, so we report this case and its management to increase the knowledge and awareness regarding this rare entity.

Case report

A 16-year-old male patient with no remarkable medical history presented with diffuse swelling over his left knee for the last 03 years and mild pain in the same knee for the last 01 year (**Figure 1A**). He did not have any history of spontaneous bleeding episodes or bleeding following trivial trauma in the past.

On local examination, his left knee showed a diffuse swelling measuring 20 × 12 cm over the knee, soft in consistency, non-tender and was not fixed to the underlying structures. The range of motion was normal, and there was no deformity. Inflammatory markers were normal, with a white blood cell count of 5.5 × 10^3/mm^3 and an erythrocyte sedimentation rate of 42 mm/h, and the platelet count was 1,58,000 per microliter. Bleeding time was 2 min 10 sec, clotting time was 3 min 35 sec. Prothrombin time was 11.4 sec, INR was 0.96, and other parameters were within the normal range.

Plain radiographs showed a widening of the intercondylar notch and areas of cortical scalloping (**Figure 1B**). MRI revealed diffuse lobulated thickening of synovium predominantly in the anterior aspect of the knee joint extending into the suprapatellar area and appearing heterogeneous on all sequences, predominantly intermediate signal intensity on T1, markedly hypointense on T2 and hyperintense on PD and STIR sequences showing blooming on MEDIC sequences and showing peripheral enhancement on post-contrast sequence suggestive of pigmented villonodular synovitis. Synovectomy was done (**Figure 2A**), and the tissue was sent for histopathological examination (**Figure 2B**, **2C**). The immediate postoperative period was uneventful, but clinical deterioration began on the evening of the day of the operation. The dressing got soaked, and the knee swelled. The dressing was changed, and compression was given in the evening. The next morning, we shifted the patient to the operation theatre and explored the knee; however, we could not find any bleeder, although oozing blood was there. In the afternoon, swelling increased further, blood pressure fell significantly, and overlying

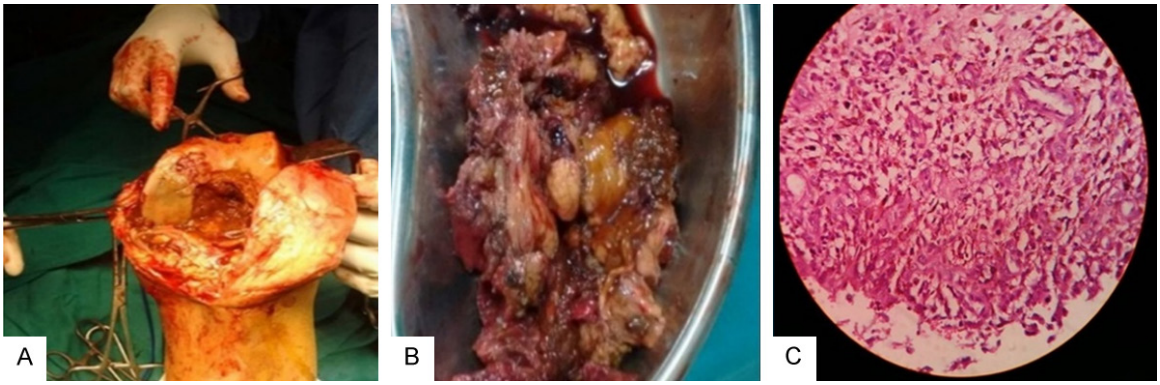

Figure 2. Intraoperative photographs show chondral erosions of the medial femoral condyle (A). Synovium was removed during the surgical procedure (B). H&E stained section taken from the synovial layer of the knee joint shows proliferation of the synovial layer along with deposition of hemosiderin pigment and mild lymphocytic infiltration (C).

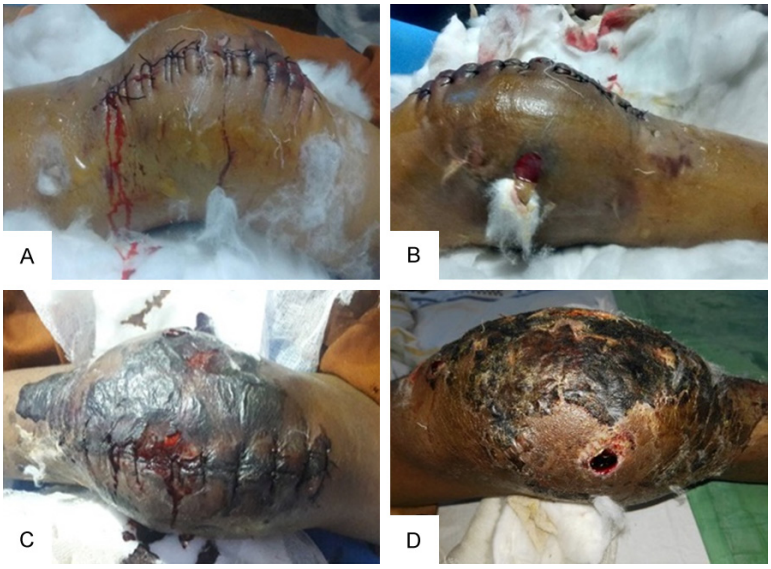

Figure 3. Clinical photograph on the first day of surgery depicting diffuse swelling, oedema of skin and ooze of blood (A). 3rd Postoperative day photograph shows a further increase in swelling, superficial blackening of the skin, and oozing of blood (B). 10th-day showing superficial necrosis of skin with cessation of bleeding (C). 20th day showing ulceration of the skin, the disappearance of oedema and blackening of skin (D).

skin started getting macerated and oedematous (**Figure 3A**). We continued with pressure bandaging and infused packed red blood cells to control blood pressure. The skin condition was deteriorating, the swelling was increasing, and blood pressure was constantly dipping, despite frequent blood transfusions (**Figure 3B**). On the third day, we repeated the coagulation profile where a PTT was 82 seconds, PT was 18.8 and INR was 1.63, and Factor VIII was 6% of normal (Factor IX and Factor XI were also normal). Tests for von Willebrand disease and factor VIII inhibitor were negative. Finally, we could make the diagnosis of mild haemophilia and started infusing factor VIII along with packed red blood cells, fresh frozen plasma and normal saline. Once factor VIII was infused, blood pressure did not fall further, and the oozing of blood stopped. Eleven units of packed red blood cells, four units of fresh frozen plasma and 12 vials of factor VIII were administered in the entire postoperative period. The diagnosis was further confirmed on histopathological examination (**Figure 2C**).

The patient remained in the hospital for fourteen days for knee physiotherapy (knee range of motion exercises, static quadriceps drill), removal of stitches, and monitoring of the coagulation profile. After a normal coagulation profile result, the patient was sent home on prophylactic coagulation factor VIII. It took 04 weeks for the swelling to subside and the skin to become normal (**Figure 3C**, **3D**).

The patient underwent an uneventful follow-up for 1 year. Active and passive flexion and extension movements of the knee were evaluated at four weeks and then at every two monthly intervals. The patient regained full range of motion after two months of his index surgery. At a

1-year follow-up, the swelling completely subsided, and there was no recurrence.

Discussion

There is a paucity of literature related to mild haemophilia. Clinical evidence and guidelines are primarily inferred from studies on severe haemophilia. This is mainly because patients with mild haemophilia do not meet the criteria for many clinical trials. Only a few cases related to different anatomical regions of the body have been reported in the literature [5, 10, 11]. With the best literature search, the authors could not find any case of knee arthropathy due to mild haemophilia. Mild haemophilia can also hamper the health-related quality of life, especially when associated with bleed-related joint destruction [12].

The delay in diagnosing haemophilia resulted in significant morbidity for the patient. The reason behind this is solely due to its relatively rare incidence. Many similar patients present with an unremarkable medical history, a negative family history of haematological disorders, and no previous history of heavy or minimal bleeding. This creates difficulty in early diagnosis, resulting in a significant delay in delivering proper care and treatment. All the initial laboratory tests were normal; however, they were not specific.

Surgery can be done smoothly with factor replacement therapy with known haemophilic patients. Problems are generally seen with unknown and undiagnosed cases of mild and moderate haemophilia, as in our case. In general, mild haemophilia is only diagnosed when an injury or medical intervention results in prolonged bleeding. Moreover, they do not usually experience spontaneous bleeds, resulting in a delay in the diagnosis of haemophilia [13, 14].

The massive hematoma formed led to superficial necrosis and maceration of the skin. We initially thought that inadequate surgical techniques and procedures related to haemostasis after the index surgery resulted in hematoma formation. However, postoperative hematoma and plummeting blood pressure appeared again even after re-exploring the complete knee in the second surgery. Haemorrhagic complications can recur despite adequate haemostatic procedures during surgery. Therefore, we conducted a blood coagulation profile, including the level of factor VIII.

Diagnosis of mild haemophilia is challenging. Although MRI and Ultrasound are considered the standard modality for diagnosing and assessing joint arthropathy, limitations have been reported in detecting hemosiderin deposition, synovial hypertrophy and cartilage loss which can result in false negative reports [15]. This is exactly what happened in our case; we could not diagnose this case earlier. The diagnosis of mild haemophilia is usually made later in life compared to the more severe forms of the disease [16]. The life expectancy of patients with mild haemophilia is almost the same as that of the average population [17]. Accurate documentation of the global epidemiology of mild haemophilia is challenging, and statistics of patients with mild haemophilia differ widely among countries [16].

Our experience with the present patient has emphasized an extremely vital issue: coagulation profile should be sought for and appropriately investigated if postoperative haemorrhage occurs, even though the surgical technique is pertinent. We present this case report and its management to make surgeons cognizant of this rare but lethal entity so that they can timely manage unexplained profuse oozing of blood during surgery.

Conclusions

Considering haemophilia as a possible reason behind profuse and unexplained bleeding during surgery can help prevent undesirable diagnostic delays and reduce haemophilia-related morbidities.

Disclosure of conflict of interest

None.

Abbreviations

MEDIC, Multiple Echo Data Image Combination; PT, Prothrombin time; PTT, Partial thromboplastin time.

Address correspondence to: Mohammad Jesan Khan, Department of Orthopaedic Surgery, Faculty of Medicine, JNMCH, AMU, Aligarh, Uttar Pradesh, India. Tel: 9997453384; E-mail: mzkhan2k1@gmail.com

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