



ORIGINAL ARTICLE

Arthroscopic synovectomy considerably reduces bleeding frequency and improves joint function in hemophilic patients with chronic synovitis



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KEYWORDS

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Summary *Background/Introduction:* Hemophilic arthropathy (HA) is the most common complication in patients with hemophilia. Arthroscopic synovectomy in HA is the optimal choice of treatment because it is less invasive.

Purpose/Aim: To demonstrate the effectiveness of arthroscopic synovectomy for HA involving the knees, elbows, and ankles.

Methods: This study retrospectively analyzed 11 patients with chronic synovitis with repeated hemoarthrosis (13 joints: 5 knees, 4 elbows, and 4 ankles) between August 2011 and August 2013. The joints that did not respond well to secondary prophylactic factor replacement and physical therapy underwent arthroscopic synovectomy for further treatment. Patient profiles, joint pain scores, bleeding frequency, and joint function scores were reviewed.

Results: The mean visual analog scale scores for pain decreased from 77.1 mm preoperatively to 27.7 mm postoperatively ($p < 0.05$). The mean annual bleeding frequencies before and after surgery were 6.1 times/y and 2.0 times/y, respectively ($p < 0.05$). Functional scores for all the joints improved. The mean Lysholm knee scale score significantly increased from 45.2 preoperatively to 74.4 postoperatively ($p < 0.05$). No major complications were observed.

Conflicts of interest: All authors have no conflicts of interest to declare.

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Conclusion: Arthroscopic synovectomy, a less invasive procedure for HA, significantly reduced joint pain, prevented bleeding episodes, and improved joint function with few complications. Copyright © 2016, Taiwan Surgical Association. Published by Elsevier Taiwan LLC. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

1. Introduction

Hemophilia is a bleeding disorder characterized by impaired function of coagulation factor IX or VIII. Hemophilic arthropathy (HA) is a major complication of hemophilia, caused by repeated hemoarthrosis; HA commonly affects joints such as the knees, elbows, and ankles.¹ The pathogenesis of HA involves the initiation of synovial and cartilage damage caused by hemosiderin, cytokines, and neoangiogenesis, resulting in molecular changes and chronic inflammation.² Clinical manifestations of HA include chronic joint pain, frequent hemoarthrosis, and limited range of motion (ROM) of joints, all caused by repeated bleeding episodes. Factor therapy for bleeding control is expensive. Arthroscopic synovectomy is a less traumatic procedure for patients with HA and can reduce their joint pain, bleeding frequency, and medical expenses as well as improve their ROM.^{3–9}

In this study, we retrospectively reviewed patients with hemophilia who underwent arthroscopic synovectomy for HA at the Hemophilia Center of Taipei Medical University Hospital, Taipei, Taiwan. We report findings regarding bleeding frequency, joint function, pain score, and complications after arthroscopic synovectomy for treating HA.

2. Materials and methods

A total of 11 male hemophilia patients (9 hemophilia A and 2 hemophilia B; 13 joints: 5 knees, 4 elbows, and 4 ankles) were included. All the patients were followed up regularly at the Hemophilia Center of Taipei Medical University Hospital. The mean age was 24 years (range, 15–28 years). All the patients received on-demand factor replacement therapy and an arthroscopic synovectomy from August 2011 to August 2013 and exhibited chronic synovitis of the joints with recurrent bleeding episodes that did not respond to narcotic analgesics, nonsteroidal anti-inflammatory drugs, or factor replacement therapy. Radiography and magnetic resonance imaging were performed on the affected joints before surgery (Figures 1 and 2), and the radiological scores of the affected joints were scaled using the Arnold–Hilgartner stages (I–V).¹

Adequate factor replacement was performed on all the patients during and after the surgery. The synovectomy was performed under general anesthesia (Figures 3 and 4). Hypertrophic hemosiderin, induced because of synovitis, was homogeneously present within all the joints. Therefore, synovectomy was performed in a step-by-step manner using the shaving procedure. Most of the synovitic tissue was removed, and the tissue samples were sent for further pathological examination (Figures 5 and 6). To prevent

hemoarthrosis after surgery, postoperative Hemovac drainage was performed routinely. Cold and elastic bandage compressions were applied after surgery for 3 days.

The factor concentration was maintained at 100% during surgery, at 80–100% after the 3rd postoperative day (when drains were left in the operated joints), at 60–80% after removing the drains in the 1st week, and at 40–60% for another week. Secondary replacement was administered postoperatively for tailored physical therapy.

Clinical data, including visual analog scale (VAS) scores (0–100 mm), ROM of the joints, and functional scores, were assessed before and 3 months after surgery. The functional scores for each joint were separately evaluated using exclusive scales including the Lysholm knee scale (0–100 points),¹⁰ Mayo elbow performance score (0–100 points),¹¹ and Karlsson and Peterson scoring system for ankle function (0–100 points).¹²

Bleeding frequency was calculated as the number of bleeding episodes per month over the study period. A bleeding episode was defined as a grossly swollen joint with obvious joint effusion. Each bleeding episode was separated by a return to baseline function and pain following factor supplement therapy. To compare the bleeding frequencies, we collected the data of bleeding episodes from 1 year before and 1 year after the surgery.

Statistical analyses were performed using SPSS version 19.0 software (SPSS Inc., Chicago, IL, USA). The means and standard deviations (SDs) are presented. Owing to the small number of patients, we used a paired-sample Wilcoxon signed rank test to compare a difference in pain or functional scores before and after surgery. A *p* value of <0.05 was regarded as statistically significant.

All patients in this study had a mean follow-up of 30.2 months (range, 16–42 months).

3. Results

A total of 11 patients (i.e., 13 joints: 5 knees, 4 elbows, and 4 ankles) underwent arthroscopic synovectomy. The maximum and minimum body mass indexes were 26 kg/m² and 17.7 kg/m², respectively. Detailed information of our patients is presented in Table 1. Two patients each had two affected joints; one received the synovectomies separately at a 3-month interval, and the other received them at a 7-month interval (Table 1).

The mean ± SD VAS scores for pain before and after surgery were 77.1 ± 8.8 mm and 27.7 ± 19.3 mm, respectively (*p* = 0.01). The mean ± SD annual bleeding frequencies before and after surgery were 6.08 ± 2.21 times/y and 2.0 ± 1.58 times/y, respectively (*p* = 0.01). The decrease in bleeding frequency also reduced factor

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