New treatment method for symptomatic bipartite patella -Ultrasonographic guidance injection and pie crust technique-

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INTRODUCTION:

The management of painful bipartite patella is controversial and there are several described treatment in the literature. Initial management of a painful bipartite patella is nonsurgical and includes: restriction of activities, immobilization, nonsteroidal anti-inflammatories, physical therapy, and local corticosteroid injections. If conservative management fails and symptoms linger, surgical treatment may be warranted. l. We hypothesized that ultrasound-guided injection and the pie crust technique would be an effective and safe treatment option for symptomatic type III bipartite patella. We examined whether surgical treatment can be avoided in patients who planned surgical treatment with ineffective conservative treatment. The purpose of this study was therefore to investigate patient outcomes following the performance of ultrasound-guided injection and the pie crust technique for the treatment of symptomatic type III bipartite patella, and determine the effectiveness and safety of novel technique.

METHODS:

We retrospectively investigated symptomatic type III bipartite patella confirmed by radiographs and treated with ultrasonographic guidance injection and “pie crust” technique of capsular-tendon structures in outpatient clinic. We included 25 knees in 22 boys (mean age, 14.2 ± 1.4 years). Indication for ultrasonographic procedure was given in case of failure of at least 2 months of conventional conservative treatment. The exclusion criteria were history of previous knee surgery and severe degenerative changes of the patellofemoral joint. Patients with less than 4 months’ follow up were excluded as well. The patients were clinically assessed using the Victorian Institute of Sports Assessment (VISA) score before and 1 week, 1 month, and 3 months after the ultrasonographic procedure. The occurrence of complications (i.e., infection, severe pain, and haematoma) were also investigated during the follow-up period.

Technique:

Ultrasound-guided injection and the pie crust technique were performed by a single knee surgeon in an outpatient clinic. The patient was placed in the supine position with their knee slightly flexed to approximately 10° and supported by a pillow. The skin was then cleansed with povidone iodine, after which a 19-mm 27-gauge needle was used to administer 3 mL of 1% lidocaine for local anaesthesia. Then, a 25-mm 25-gauge needle was guided into the knee from a lateral approach using a short-axis view of the patella to ensure proper placement just between the patella and free fragment. Once proper placement was established, we injected 2 mL of 1% lidocaine and 5 mg of triamcinolone acetonide between the patella and free fragment (Figure 1). We subsequently identified the vastus lateralis tendon and lateral retinaculum contiguous to the accessory fragment, and punctured 10 sites from 1 skin puncture with a 38-mm 18-gauge needle to lengthen these structures (Figure 2).

Post-procedure rehabilitation protocol:

To avoid haematoma formation on the first day after the procedure, wounds were pressed with gauze and carefully examined the next day. We also ordered rest for 1 day after the procedure and allowed exercise only after haemostasis was confirmed. Exercise was recommended as follows: flexion and extension exercises 2 days after the procedure, running exercise 4 days the after procedure, and complete return to sports activities at the patients’ discretion but at least 1 week after the procedure. No braces were to be used following this procedure, and full weight-bearing was allowed as tolerated immediately after the procedure. The ultrasonographic procedure was repeated every 2-4 weeks according to patients’ wishes. If treatment did not improve their symptoms, accessory fragment extraction was performed under general anaesthesia.

RESULTS:

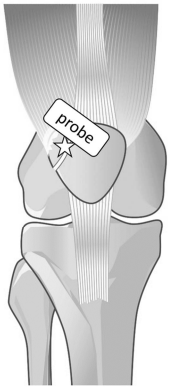
The mean duration from symptom onset to the procedure first being performed was 3.8 ± 1.4 months, and the procedure was performed an average of 1.6 ±0.9 times. Mean VISA scores were 40.5±8.5 before treatment, 76.4±12.4 at 1 week after treatment, 86.2±11.5 at 1 month after treatment, and 92.6±15.2 at 3 months after treatment. VISA score improvements from before treatment to 1 week after treatment, and from 1 week to 1 month after treatment, were significant (both $P < 0.01$). Three patients (5 knees) had poor results and could not return to sports, and thus underwent surgical treatment 4 months after the ultrasonographic procedure. However, the other 19 patients were able to fully return to sports a mean of 3.8±0.9 weeks after the procedure. There were no complications in any of the patients.

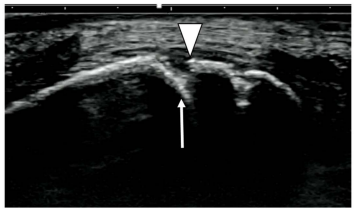
DISCUSSION AND CONCLUSION:

The performance of ultrasound-guided injection and the “pie crust” technique for the lengthening of the vastus lateralis tendon and lateral retinaculum under local anaesthesia was found to safely and effectively treat symptomatic type III bipartite patella. This was particularly supported by the significant improvement in the mean VISA scores post-treatment,

and the absence of procedure-related complications. Thus, we recommend the consideration of this novel technique for the treatment of symptomatic bipartite patella prior to surgical treatment in cases where other conservative treatment methods are unsuitable.

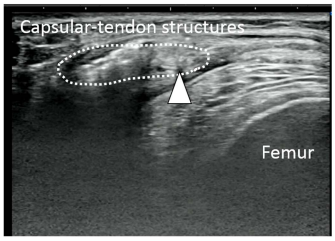
Fig. 1 Ultrasonographic guidance injection





Arrow: Between patella and free fragment
Arrow head: Needle

Fig. 2 “pie crust” technique of capsular-tendon structures



Arrow head: Needle