

Traction-related problems after hip arthroscopy

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ABSTRACT

Traction-related problems are poorly described in the existing literature. The purpose of this prospective study was to describe traction-related problems and how patients perceive these problems. The study was a descriptive cohort study and data were collected from questionnaires and patient files. The questionnaire included questions on patients' perceptions of traction-related problems in the groin area, at the knee and ankle and how patients had coped with these problems. A total of 100 consecutive patients undergoing hip arthroscopy filled out the questionnaire. Primary findings of this study were that 74% of patients reported some sort of traction-related problems after hip arthroscopy. About 32% of the patients had problems in the groin area and 49% of the patients complained of symptoms in the knee joint. A total of 37% of the patients had experienced problems from the traction boot in the ankle area. The complications were found to be temporary and disappeared after 2–4 weeks. Five patients still had complaints after 3 months. All five patients had a pre-existing knee injury prior to undergoing hip arthroscopy. Traction-related problems after hip arthroscopy are a challenge and our study showed that 74% of the patients reported traction-related problems. This is significantly higher than previously reported. The present study found a high rate of complaints from the knee and ankle joints that have not previously been reported. The presented data suggest the need for more pre-surgery patient information about possible traction-related problems.

BACKGROUND

Hip arthroscopy for femoroacetabular impingement and the resultant labral and cartilage pathology has increased significantly over the past decade. Traction is necessary during hip arthroscopy in order to separate the femoral head from the acetabulum, thereby providing space for the introduction of the arthroscope and instruments. This can lead to soft-tissue injuries associated with the traction itself or from compression in the perineal area. These injuries are among the most commonly reported complications of hip arthroscopy. Neuropraxia of the ischial nerve and the femoral nerve related to traction have been described in several studies. Pudendal nerve neuropraxia and lesions to the scrotum and the labia have also been described. Because traction is applied to the whole leg, the traction is also applied to the knee and ankle joints for a prolonged length of time which might give rise to complications from these areas [1, 2]. Other complications reported in the literature include iatrogenic injury of the intra-articular cartilage and penetration

of the labrum on entry to the hip joint, extravasation of irrigation fluid to the retroperitoneum, avascular necrosis of the femoral head and femoral fractures. There are also descriptions of portal related injuries to the nerves, particularly the lateral cutaneous femoral nerve. Breakage of guide wires and arthroscopic instrument parts inside the joint are also common. Finally, deep vein thrombosis (DVT), pulmonary embolisms and infections are described [1]. Reviews regarding complications related to hip arthroscopy show complication rates no higher than 8% [1, 3, 4].

The aim of this investigation is to clarify the type and extent of not only the traction-related complications but also those hidden snags that are not disabling, which we call minor problems, and how the patients perceive these problems.

METHOD

The study was a descriptive cohort study and data were collected from questionnaires and patient files. The questionnaire

included questions on patients' perceptions of traction-related problems in the groin area, at the knee and ankle and how the patients had coped with these problems. A total of 100 consecutively enrolled patients filled out the questionnaire.

All participants had been asked to fill out the questionnaire 10 days post-operatively and hand it in at the 2-week follow-up. On a Visual Analogue Scale (VAS) from 0 to 10 where 0 indicates no pain and 10 indicates worst possible pain the patients reported the worst pain in the groin, knee and ankle area within the first 10 days post-operatively. The patients stating that they had problems at the two-week follow-up visit were asked at the three-month follow-up for how long they had experienced these symptoms.

The questionnaire was constructed through previously collected empirical data and from interviews with patients reporting traction-related complications. The questionnaire consisted of 25 questions and has not been validated (Supplementary Appendix S1). For statistical analysis, a P values of <0.05 was considered statistically significant.

Furthermore, three female and three male patients who reported traction-related problems were interviewed. The patients were randomly selected over a period of six months and were interviewed by the same investigator (L.F.). The selection was made by randomly choosing a man in the first month, and a woman in the next month and so on until six patients were included. The selection was made only in regard to gender and was not related to BMI, traction time or age. The interviews were conducted 6 weeks post-operatively and were supposed to give a deeper understanding of how these patients perceived their traction-related complications. An interview guide was used which structured the interview into themes; the questions were phrased in such a way that it allowed the patients to describe their perception of the traction-related problems in their own words. The analysis of the interviews was based on hermeneutics methods where concrete descriptions are interpreted and transferred to give a new understanding [5].

Surgical technique

Surgery was performed with all patients under general anesthesia and positioned in the supine position on a standard fracture table (Fig. 1). The traction boot was used in all patients and the feet were well padded inside the boots. The bollard was carefully placed in the groin area and care was taken not to cause damage to the genital area. Traction was applied to both legs, but counter traction on the contra lateral leg was limited to keep the patient from rotating around the bollard. To minimize traction time trial traction was applied to assess the ease of distraction and



Fig. 1. Hip arthroscopy in the supine position.

then the traction was released again. The patient was then draped and the equipment was set up; the traction was applied again under image intensifier control. The amount of traction was set as low as possible and was kept under 2 h as recommended in the literature [2, 6]. Total traction time was noted in the patient file. Two very experienced hip arthroscopists performed all the operations and all patients were discharged within 2–4 h after the surgery. They were all seen for follow-up after 2 weeks and 12 weeks, respectively.

RESULTS

A total of 60 female and 40 male patients filled out the questionnaires. Mean age was 37 years (range 18–65).

A total of 26% of the patients reported that they had no problems related to traction; conversely, 74% of the patients reported at least one problem either at the groin, knee or ankle.

Mean traction time in the group of patients reporting traction-related problems was 39 min (15–80 min). The mean traction time in the group of patients not reporting any problems was 36 min (19–55 min). There was no significant statistical difference between traction times. The BMI of the patients was not associated with the complication rate; BMI was 25 and 26 in the two groups, respectively.

PROBLEMS IN THE GROIN AREA

A total of 32% of the patients reported problems in the groin area and of these; 12 patients reported more than one problem. Fourteen patients experienced swelling/hematoma in the groin area. Ten patients reported scratches/lacerations on the labia or the scrotum. Twenty-two patients experienced numbness in the groin area. The problems were temporary and disappeared typically within 2–4 weeks. Three patients still experienced numbness in the groin area after two months. The 32 patients reporting problems reported an average pain of 2.6 on the VAS-scale when recalling the worst pain in the groin area within the first 10 days post-operatively. Seven of the patients reported a score > 4 on the VAS-scale. There were no significant differences regarding gender (32% female/33% male).

PROBLEMS RELATED TO THE KNEE AREA

A total of 49% of the patients reported problems related to the knee area and of these 19 patients experienced more than one problem. The problems reported were swelling, feeling of laxity and numbness. Twenty-seven patients complained of laxity in the knee and 19 reported swelling of the joint. Twenty-two patients reported numbness in the knee area. The complications were also temporary and disappeared after 2–4 weeks in most patients. At the 3-month follow-up, five patients still complained of swelling, feeling of laxity and numbness in the knee. All these patients had a previous injury to the knee joint. There were no significant differences regarding the patient reported average pain of 3.3 on the VAS-scale where 49 patients recalled the worst pain in the knee area within the first 10 days post-operatively. Thirteen of the patients reported a score of > 4 on the VAS-scale.

PROBLEMS RELATED TO THE ANKLE AREA

A total of 37% of the patients reported problems related to the ankle area and of these 13 patients reported more than one problem. The problems reported were swelling, numbness and pressure spots from the traction boot. Thirteen patients experienced swelling and twelve patients reported numbness around the ankle. Fifteen patients had pressure spots from the traction boot. Most of the problems resolved within 2–4 weeks and only two patients reported a feeling of numbness around the ankle after three months. Thirty-seven patients recalled the worst pain in the ankle area within the first 10 days post-operatively as 3.4 on the VAS-scale. Ten of the patients reported a score > 4 on the VAS-scale. There were no significant statistical differences regarding gender (40% female/32% male).

RESULTS OF THE INTERVIEWS

The interviews showed that the patients experienced a lack of information regarding problems, duration of the problems and how to manage them. They also expressed a need for a dialogue about these problems with the health care staff. Patients developed their own strategies for managing these problems. The expectations regarding possible traction-related problems did not match what the patients actually experienced. A summary of patients' experience of problems is shown in [Table 1](#).

DISCUSSION

The primary finding of this study was that 74% of patients reported some sort of traction-related problem after hip arthroscopy. This high rate of problems has not previously been reported in the literature; this could indicate an

underreported problem, which might be because some were too mild to have been reported without being asked.

In a study from 2003, the complications in 1054 patients undergoing hip arthroscopy were described over a period of 13 years [7]. They described three patients with pudendal nerve problems and one patient with a laceration in the perineal area. There are no descriptions of complications related to either the knee or the ankle area. In the mentioned study, patients were asked about complications at 6-week follow-up, so there could be a recall bias, as patients could have forgotten about the complications they might have had during the first 6 weeks. In the present study, there was only focus on possible traction-related problems and the respondents were focused on this issue and were asked by questionnaire to report any perceived problems 10 days post-surgery. That means that they were aware of the possibility that traction might lead to some problems. The present study demonstrated that 32% of the patients had problems in the groin area. The problems were a result of the pressure from the bollard to the perineal area. This problem is also known from bicycle road racing, where long distance riders are exposed to a constant pressure in the perineal area from the saddle. Studies have shown that prolonged pressure from the saddle can lead to lacerations, numbness, urinating problems, loss of sensation in the penis and impotence [8–10]. Traction-related complications in the groin area have been reported earlier in studies regarding femoral nailing [11, 12]. These studies showed that 10–15% of the patients had pudendal nerve affection. In the present study, 22% of the patients reported pudendal nerve affection. One female reported during the interview that the paralysis did not hurt, but that she could not feel anything in the area when wiping herself after a toilet visit. A male patient explained that he was worried about not regaining his sensation in the area. Both patients wished that they had been better informed prior to surgery about this type of complication and the possible duration of symptoms. None of our patients reported numbness or weakness from the ischial nerve.

The problems in the groin area were in addition to the described numbness also scratches and lacerations in the perineal area. In the present study, 10 of the respondents had a scratch or a laceration after the surgery. It cannot be ruled out that the padding around the bollard may play a role in avoiding these complications [13]. It is, therefore, relevant that the surgeon and the surgical staff register data about the length of traction and that the nurses in the recovery room report if they find any signs of lesions in this area post-operatively. A young male was interviewed about a laceration of his scrotum and he reported that it was 3 cm in diameter and that it was stinging and suppurating.

Table I. Patients' experience of problems

<i>Informants</i>	<i>Problems</i>	<i>Symptoms</i>	<i>Interview examples</i>
Informant A Female 22 years	Groin	Swelling/hematoma	"The pain in the knee and the ankle was much worse than in the groin area"
		Sensory disturbances Reduced sexual activity	"Before the surgery my focus was on the operation, so I didn't tell about my many problems with my ankles and knee joints, because of many distortions"
	Knee	Swelling	"It would have been nice to know about the risk of getting complications"
		Feeling of laxity Aching, stabbing pain (VAS 7)	
Informant B Male 21 years	Groin	Swelling/hematoma	"The wound I got on my scrotum stung much worse than the pain I felt from the hip"
		Abrasion/scratches	"I was actually in doubt whether the numbness in the groin area would be permanent, until I asked about it"
		Sensory disturbances Stinging, stabbing pain (VAS 5)	"I would have liked some information about how to treat the wound I got on my scrotum"
	Ankle	Swelling Sensory disturbances	
Informant C Female 39 years	Groin	Sensory disturbances	"I had so much unrest in my knee that I woke up at night and had trouble falling asleep again" "The only thing that helped was massage"
	Knee	Swelling	"The primary thing for me was the hip operation and I didn't think much about having complications from the traction"
		Feeling of laxity Sensory disturbances	
	Ankle	Pressure marks	
Informant D Male 35 years	Groin	Sensory disturbances	"I felt numbness all the way from the groin down on both sides of the thigh and past the knee"
	Knee	Sensory disturbances	"I am happy that you told me about the complications from the traction or I would otherwise have been really nervous"
Informant E Female 41 years	Groin	Swelling/hematoma	"I was surprised that you could get big scratches on the labia. I had been told that I could get sore and experience some swelling, but this was much worse" "I would have preferred to have the worst scenario described" The scratch itched so much I put sour cream on it" "There I needed some advice on the proper treatment"
		Abrasion/scratches	
	Knee	Swelling	
	Ankle	Pressure marks	
Informant F Male 26 years	Groin	Abrasion/scratches	"I had an abrasion and I experienced a burning sensation. I rather quickly smelled some odour from the groin" "My ankle was very swollen, like when I had a distortion" "I could only use my leg because I had crutches" "It was the hip operation that mattered the most, even though I had more pain in my ankle than in my hip"
	Knee	Feeling of laxity Sensory disturbances	
		Ankle	Swelling Aching pain (VAS 8)

Despite the obvious problem, he only mentioned it at the 6-week interview when being directly asked. A possible reason could be embarrassment about raising issues related to perineal symptoms.

Surprisingly, the present study showed that 49% of the patients complained of symptoms in the knee joint in the form of swelling, a sense of laxity or numbness around the knee joint. Despite this high rate of complaints, the literature on this topic is sparse. As part of the standard rehabilitation after hip arthroscopy patients were instructed to use

crutches for 3–4 weeks with partial weight bearing. Some of the patients reported that the limited weight bearing had alleviated the symptoms from the knee and ankle. Five patients still had problems after three months. All five patients had a knee injury prior to undergoing hip arthroscopy. It is important to inform patients about the risk of problems in the knee and to be aware of any pre-existing knee conditions.

It is very likely that patients with previous knee conditions have a higher risk of developing longer lasting

traction-related problems than patients with no previous knee injuries. Among the knee symptoms, the feeling of laxity is the most frequent, probably because of the traction forces applied to the knee ligaments in relation to distraction of the hip joint. A 22-year-old female athlete described swelling and laxity in her knee, almost similar to a distortion of the knee joint. She knew from previous experiences that she had to rest the knee for a while and after approximately 3 weeks the knee felt normal again.

A total of 37% of the patients had experienced swelling, numbness or pressure marks from the traction boot in the ankle area. Like the problems from the knee joint these problems are also scarcely mentioned in the existing literature. One study reported a case where a patient had a vascular obstruction in the ankle [14] and another study described skin irritation and superficial paraesthesia because of the tight fixation of the foot [15]. Another study described a 58-year-old female with an ankle fracture after a hip arthroscopy [16]. The same author also described ankle pain after hip arthroscopy [16]. The foot and ankle are very vulnerable during traction, because the foot is internally rotated during the surgery as well as subjected to traction forces and pressure from the traction boot. Several factors might influence the risk of postsurgical complications and they might include previous distortions and laxity of the ligaments around the ankle joint. One female patient in our cohort reported a worse pain in the foot than from the operated hip. She could hardly stand on her foot the first week after surgery and had to take analgesics to relieve the pain.

A strength of the present study is the fact that the patients were asked to evaluate potential problems early postoperatively, thereby reducing recall bias. The consecutive patient data collection is also a strength. A weakness of the study is the fact that only six patients are included in the qualitative analysis of complication experience.

The high rate of early problems in this study may be ascribed to postsurgical symptoms inevitable to traction during surgery rather than to complications according to critics. This, however, does not change the fact that this is very poorly described in the existing hip arthroscopy literature. It is beneficial for the patients that they receive thorough preoperative information about possible traction-related problems and their duration. We find that it is important for the patients to know that they might experience these problems and also that the symptoms are highly likely to disappear within a few weeks.

CONCLUSION

Traction-related problems after hip arthroscopy are a challenge and our study showed that 74% of the patients reported traction-related problems. This is significantly higher than previously reported. The present study found that there is a rather high rate of complaints from the knee and ankle joints which have not

been emphasized in previous reports. The reported rates of symptoms from all three studied areas were almost the same: 32% experienced groin-related symptoms, 49% experienced problems at the knee and 37% in the ankle area. Problems were transient and typically disappeared within 2–4 weeks. The presented data suggest the need for more pre-surgery patient information about possible traction-related problems.

To minimize traction problems, it is important to pay attention to preventive measures. A well padded bollard should be placed carefully in the groin area in order to avoid damage to the genitals. To avoid pressure spots and pressure on nerves well-padded boots are important. The amount of traction and total traction time must be kept to a minimum.

SUPPLEMENTARY DATA

Supplementary data are available at *Journal of Hip Preservation Surgery* online.

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CONFLICT OF INTEREST

None declared.

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