



ARTICLE

## Complications after scrotal surgery – still a major issue?

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### ABSTRACT

**Objective:** Gold standard treatment of symptomatic hydrocele or spermatocele is surgery. Despite a minor procedure, complications such as bleeding and infections leading to reoperations may be devastating for the patients. In autumn 2018, an accumulation of complications was seen in our department. The aim of this study was to investigate the rate and grade of complications and to identify potential means to reduce these.

**Materials and methods:** Patient records of all patients undergoing surgical repair of hydrocele or spermatocele from December 2017 to November 2018 were examined. Results were audited to identify potential causes of complications. The focus was on the perioperative hemostasis and postoperative activity restrictions. The outcome was compared to a consecutive patient series operated the following year.

**Results:** Sixty-five men were operated on during the first period. Twenty-two patients contacted the department postoperatively due to swelling or pain, 19 patients were examined at the hospital and six patients were re-operated 1–9 times. The following year, 69 patients were operated on. Of these, 16 patients contacted the department postoperatively ( $p=0.17$ ), 13 patients were examined at the hospital, and five patients were re-operated ( $p=0.68$ ). There was the same complication rate in patients operated by specialist urologists or supervised younger doctors. However, patients preoperatively examined and informed by a specialized urologist had significantly fewer complications compared to those informed by urological residents and interns ( $p=0.012$ ).

**Conclusion:** Despite the change in patient information and increased awareness of possible complications, a high proportion of patients still were in need of unplanned contact to the department and reoperation.

### ARTICLE HISTORY

Received 17 December 2020  
Revised 25 January 2021  
Accepted 27 January 2021

### KEYWORDS

Testicular hydrocele; spermatocele; postoperative complications; medical education; patient information

### Introduction

Men with bothersome hydrocele or spermatocele are common patients in the benign urology clinic. Symptoms leading to referral can be the heaviness of the scrotum, pain, cosmetic reason, or fear of an underlying malignant condition.

A recent comprehensive Swedish study [1] investigated 33,061 men with hydrocele and spermatocele during a 10-year period. They found that the annual incidence of men seeking urologists due to scrotal conditions was 98.5 out of 100,000 men (59.9 for hydroceles and 38.5 for spermatoceles). Of these men, around 20% were treated with either surgery (70%) or aspiration (30%) and 80% accepted the condition without treatment. Complications were seen in 17.5% of the 9175 men who were operated.

In autumn 2018, an accumulation of complications was seen in our department. The aim of this study was to investigate the rate and grade of complications and to identify potential means to reduce these.

### Materials and methods

We examined patient records of all adult patients undergoing surgical repair of hydrocele or spermatocele in the

Department of Urology, Regional Hospital West Jutland from December 2017 to November 2018 (Period A). In our department, it is an outpatient procedure, where the patient is sent home a few hours after the operation without any planned control. Hence, any unplanned postoperative contact was considered a potential complication.

The following factors were identified: Age, hydrocele or spermatocele, Anticoagulants, the charge of the doctor giving the preoperative information (consultant/urological resident in training/intern), the charge of surgeon(s), time of year (spring, summer, autumn, winter), complications (Y/N), number of days after initial surgery, number of postoperative contacts, contact by phone or examination at the hospital, ultrasound of the scrotum, conservative treatment, antibiotics or reoperation(s). All patients were referred to our department by their general practitioner. In our outpatient clinic, the patients were examined and informed about their condition. If the condition had relevant symptoms, an operation was planned.

The results were audited in the plenum at the department to identify any potential means of a reduction in complication risk. The patient records of operated patients the following year were then examined prospectively (Period B).

## Statistics

All data were checked for normality and a *t*-test or Mann–Whitney Rank Sum Test was made accordingly. All statistical analyses were performed using SigmaStat 3.5 (Systat Software, Inc.).

## Ethics

The local ethics committee was asked and no special permission was needed as it was considered a quality control study (Central Denmark Region, ref. no. 6360009). Data were handled in accordance with the regional guidelines.

## Results

A total of 65 men, aged  $60 \pm 15$  years were operated on for spermatocele or hydrocele during Period A (December 2017 to November 2018). Of these, 22 (34%) contacted the department postoperatively due to swelling or pain, 19 patients were examined at the hospital 1–3 times and six (9.2%) patients were reoperated (1, 1, 5, 6 or 9 times.)

Focus on the perioperative hemostasis and postoperative activity restrictions were singled out as main-focus areas. The written patient information was changed. It was underlined that even though hydrocele and spermatocele repair are fast procedures carried out in the outpatient surgical department, these are not just simple small operations. Consequently, the patient should plan ahead to restrict physical activity to an absolute minimum postoperatively. Furthermore, the choice to have the condition operated in the first place should be carefully considered.

After the audit and following change in awareness, 69 patients aged  $58 \pm 15$  ( $p = 0.25$ ) were operated on during Period B from December 2018 to November 2019. During this year, 16 patients (23%,  $p = 0.17$ ) contacted the department postoperatively, 13 patients (19%,  $p = 0.70$ ) were examined once at the hospital, one patient was examined twice and one patient was readmitted three times. Five patients (7.2%,  $p = 0.68$ ) were reoperated (1, 1, 1, 5 or 6 times). The results are summarized in Table 1.

A total of 47 patients were operated by a urologist, 66 patients by a urological resident in training or intern supervised by a urologist, 13 patients were operated by a senior resident and 9 patients by an intern supervised by a senior resident. There was no difference in complication rate when stratified for the rank of the operating doctor(s) nor when

comparing time periods. Furthermore, there were no differences in the age of the patients with and without complications.

The first year, 11 out of 65 patients had been preoperatively examined with regard to indication and informed in the outpatient clinic by a urologist. Two of these (18%) experienced complications. Interns or residents handled the remaining patients pre-operatively and 38%, respectively 36% of those patients had complications. This difference was not significant. However, when comparing the patients in Period B, significant fewer complications were found among the patients informed by urologists in the outpatient clinic compared to those informed by doctors in training: 5% (1 of 19 patients) informed by urologists, 30% (6 of 20 patients) informed by the youngest intern ( $p = 0.04$ ), 30% (9 of 30 patients) informed by residents ( $p = 0.04$ ). No difference was seen between junior doctors and residents. When analyzing all 134 patients, a significantly lower complication rate of those preoperatively seen by urologists was found when comparing with all other doctors ( $p = 0.012$ ).

Regarding the time of year, it was noted that autumn 2018 (September–November), leading to this study had a complication rate of 56% (Table 2). This was the highest rate throughout the observation time when distributing the data after the season. The complication rate was significantly reduced to 7.7% ( $p = 0.008$ ) during the following winter months. When analyzing the total number for both years, there was still a significant seasonal difference from 38% complications in autumn to 15% in winter ( $p = 0.048$ ). There were no other significant seasonal differences.

## Discussion

Hydrocele and spermatocele are benign conditions often leading to referral to a urological department. In our department, we found a complication rate of 34% in the first year of this study. It was nonsignificantly reduced to 23% the following year. This is in accordance with the literature, where a complication rate of 17–27% has been described [1–4].

Educating and supervising the next generation of urologists is a very important task in every department of Urology and should be prioritized. During a 2-year period, in 65% of the operations in our department, a doctor in training was involved. This study showed that the complication rate after hydrocele or spermatocele repair was not significantly different among patients operated by either experienced urologists or supervised residents or interns. The senior residents operated alone, without an increase in complication,

**Table 1.** Complications after scrotal surgery.

	Period A	Period B	<i>p</i>
Patients	65	69	
Age	$60 \pm 15$	$58 \pm 15$	0.245
Hydrocele	39 (60%)	41 (59%)	0.95
Complication	22 (34%)	16 (23%)	0.174
Ultrasound by radiologist	11 (17%)	7 (10%)	0.254
Antibiotics	14 (22%)	8 (12%)	0.123
Reoperation	6 (9.2%)	5 (7.2%)	0.680

Period A: December 2017 to November 2018; Period B: December 2018 to November 2019. Complication defined as any unplanned contact to the department.

**Table 2.** Seasonal change in complications.

	Period A	Period B	Both years
Winter (Dec–Feb)	23% (3/13)	7.7% (1/13) <sup>a</sup>	15% (4/26) <sup>a</sup>
Spring (March–May)	25% (6/24)	26% (5/19)	26% (11/43)
Summer (June–Aug)	33% (4/12)	29% (4/14)	31% (8/28)
Autumn (Sep–Nov)	56% (9/16) <sup>a</sup>	26% (6/23)	38% (15/39) <sup>b</sup>

Number of complications, distributed after season. Significant increases was seen in: <sup>a</sup>cases in autumn, in period A, compared to Winter the following year ( $p = 0.008$ ) and <sup>b</sup>all autumn patients compared to patients operated during Winter ( $p = 0.048$ ). There were no other significant findings, when looking at seasons..

indicating that their training had been sufficient before reaching this level. This is in line with a large American study of resident involvement in the common urological procedure [5]. They analyzed 1378 cases, which involved residents in 31.4% of the cases. Resident involvement was associated with a prolonged operation time and a higher number of non-White patients among the resident's patients. No increase in complications was seen. They concluded that resident involvement is safe. Interestingly, they had an extremely low complication rate of 2.3%. This may partly be explained by different logistics of the health care, as 96% of their patients were operated as an outpatient procedure and those patients were thought to go to a primary care physician if complications developed.

When looking at complications after a certain procedure, one might think that the surgery in its self is the most important; but this may not be the whole truth. We found that there was a significant difference in the outcome of the operation according to the charge of the doctor selecting the patient for the operation. With a total complication rate of 10% when selected by a urologist, compared to 34% for all other doctors (residents/interns), this is very relevant to discuss. From a large cohort, on average, around 20% of men referred with spermatocele or hydrocele were treated [1] while the remaining 80% were not, which could be due to the benign nature of the condition [6,7]. From the present study, we do not know how many patients were referred to our department with a diagnosis of hydrocele or spermatocele and not operated on and whether there was a difference in the percentage of those referred to surgery or not among urologists compared to young doctor and residents. However, this emphasizes merely the importance of proper preoperative information given well in advance. Right before the procedure, the patient is reformed by the surgeon. In this situation, the patient may be nervous and afterwards, he might be less focused on receiving information due to the anesthesia or pain from the wound. Hence, the preoperative information delivered well in advance in the outpatient clinic is, in combination with written patient information, of utmost importance. The latter being a recent area of focus within the European Association of Urology (EAU), where excellent written information and films ('your procedure explained') have been made [8]. However, the patient information has firstly focused on urologic cancers; but also varicocele has been included and hopefully patient information concerning hydrocele and spermatocele repairs will appear in the future. In Denmark, patient information is made and adjusted locally in all urological departments and has been an important part of the daily work for many years, especially concerning outpatient operations. Procedures such as ureteroscopic removal of ureteral stones [9] as outpatient procedures have been the clinical standard for many years and even laparoscopic nephrectomy [10] can be implemented successfully with the right information and setup. From the present study, the importance of patient information is clear. Supervision and educating the young doctors is important, not only during the surgical procedures but also in communication with the patient.

A total of nine patients were reoperated. Four were operated on within 24 h due to bleeding with no further intervention. Five patients were reoperated later, due to infection. With one exception, all these patients were reoperated several times: First, the abscess was incised, inevitably causing a large wound. Second, several wound debridements under general anesthesia were needed and two patients underwent orchiectomy. Surgical management of scrotal infection is so far only sparsely described in the literature. Hence, best practice remains and often these operations are carried out in the afternoon or evening by a different doctor every time, which may prolong the course if no plan is made for a negative pressure dressing or second suture. The rather high number of reoperations for some patients underlines the importance of this when handling complications. Furthermore, it underlines the importance of patient selection and information as this is a benign condition where surgery may be avoided.

Interestingly, we found that more complications occurred during autumn. We could not find a reason for this and it was only evident for the first year, in fact, it was the period leading to this present study and hence it might be a coincidence. To our knowledge, it has not previously been discussed within urology. In trauma and artificial joint surgery, an accumulation of complications during hot summer months have been described previously [11], but not all reports have found this [12] though the proposed pathophysiology with increased infection due to humid and hot weather seem likely.

In conclusion, despite the change in patient information and increased awareness of possible complications, a high proportion of patients were in need of unplanned contact to the department after hydrocele or spermatocele repair. As a significant difference was seen when looking at the experience of the doctor giving the preoperative information, there still might be potential for improvement with continuous awareness.

## Disclosure statement

No potential conflict of interest was reported by the author(s).

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