



Original Contribution

# Impact of spinal versus general anesthesia on postoperative pain and long term recurrence after surgery for pilonidal disease ☆, ☆ ☆



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## Abstract

**Study objective:** To assess the effect of the kind of anesthesia on postoperative pain and long term recurrence rate in pilonidal sinus disease.

**Design:** Retrospective study.

**Setting:** Surgical departments of German Armed Forces Hospitals in Hamburg, Bad Zwischenahn and Hamm.

**Patients:** 583 pilonidal sinus disease (PSD) surgery patients operated for pilonidal disease.

**Intervention:** Interview of randomly selected patients, who had been followed up to 20 years after PSD surgery.

**Measurements:** Analysis of long term recurrence-free survival and postoperative pain scores among patients who received different anesthesia modalities.

**Main results:** Recurrence occurred in 21.97% of patients who received general anesthesia with intubation (ITN), in 23.32% of spinal anesthesia (SPA), and in 31.91% of local- or cryoanesthesia. Our data indicate that there was no significant difference in recurrence-free time between the types of anesthesia in any of the surgical procedures applied. Pain scores of patients who underwent primary midline closure ( $4.74 \pm 2.63$ , 95% CI [4.36, 5.12]) were significantly lower than pain scores of patients who underwent marsupialization ( $6.12 \pm 2.71$ , 95% CI [5.17, 7.07]) or primary open treatment ( $6.09 \pm 2.79$ , 95% CI [5.79, 6.39]) ( $P < .0001$ ). Post-operative pain scores did not differ between patients who received ITN or SPA. Cryo- or local anesthesia resulted in significantly lower post-operative pain scores compared to ITN ( $P = .0089$ ) or SPA ( $P = .0031$ ).

**Conclusion:** The use of SPA or general anesthesia did not affect the long term recurrence rate in PSD. Post-operative pain experienced either in-hospital or after discharge did not differ between patients receiving ITN

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or SPA. With other cryo- or local anesthesia, postoperative pain score was significantly reduced in any surgical procedure. However, due to the higher recurrence rate after cryo- or local anesthesia, only SPA and general anesthesia should be applied. The decision whether spinal or general anesthesia is applied in PSD surgery remains a purely anesthesiological decision based on standard considerations.

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## 1. Introduction

Pilonidal sinus disease (PSD) is seldomly seen in Africa and Asia [1] but its incidence is generally higher in young males in Europe and in Northern America. The incidence of PSD is steadily increasing for as yet unknown reasons [2]: Within the German Federal Armed Forces the incidence rose from 0.3/1000 in 1985 to 2.4/1000 in 2007 [3] and incidence rose within the German non-military population from 29/100,000 in 2000 to 48/100,000 in 2012 (age standardized data from the German Federal Office for Statistics, www.gbe-bund.de). PSD operations already exceed the number of surgical procedures for inguinal hernia in the age segment between 20 and 40 years in Germany. PSD is operatively treated in a prone position and different surgical strategies such as primary open treatment, primary midline closure, and primary asymmetrical closure have been previously described, as have recurrence rates [4,5]. With the increasing incidence of PSD and the simultaneous increase in economic pressure and competition, every safe measure to ensure quality of care must be taken. Historically, spinal anesthesia (SPA) was used during PSD surgery, and local anesthesia was seen as a contraindication [6].

Schmittner et al. examined the difference between SPA and total intravenous anesthesia with respect to postoperative pain and complications in a small cohort of 50 PSD patients [7]. They found that patients receiving SPA experienced a significantly shorter time spent in recovery room, earlier ability to drink and eat, lesser sore throat, lesser postoperative nausea and vomiting, and reduced need for analgesics. They concluded that SPA was superior to total intravenous anesthesia for PSD surgery [7].

When general anesthesia is used for operative treatments, some authors recommend airway management with a laryngeal mask (LMA), which enables placing the patient in a prone position before induction, reducing the manpower required for the positioning, shortening the induction-incision time, and minimizing hemodynamic changes compared to the standard technique of anesthesia induction in the supine patient with intubation before turning the patient to the prone position [8–13]. LMA have also been described as an airway rescue method in prone patients [14]. However, in the setting of the current study, it is the policy not to use LMA in prone position.

Cuvas et al. showed that SPA with 1 ml of 0.5% plain bupivacaine or levobupivacaine was a safe option to enable both good surgical conditions and adequate anesthesia for adult male ASA-physical status 1 patients undergoing PSD surgery

in a prone position [15]. Imbelloni et al. described a technique to perform SPA in a prone position. They recommended positioning a pillow under the patient's abdomen to correct the lordosis and, hence, extend the interspinal room [16].

In a long term follow up we have previously shown that patient satisfaction in pilonidal sinus disease is linked to long term recurrence-free survival but not to the surgical strategy or duration of treatment or wound-care [17]. In our ongoing analysis of factors in addition to recurrence-free survival that affect quality of care in PSD, we assessed the effect of the kind of anesthesia (general anesthesia with intubation (ITN) vs SPA) on long term recurrence rate and postoperative pain. We followed the long term postoperative course of PSD among 583 patients who were admitted to the surgical departments of three German Armed Forces Hospitals between 1980 and 1996.

## 2. Material and methods

Methods and patient cohort composition of this retrospective study have been described previously [17]. All patients with primary PSD admitted to the surgical departments of the German Armed Forces Hospitals in Hamburg, Bad Zwischenahn and Hamm for surgery between 1980 and 1996 were traced by the Institute for Military Medical Statistics and Epidemiology of the German Federal Armed Forces (Andernach). Surgical diagnosis, postoperative pain and type of anesthesia employed were confirmed by correlating referral and discharge letters, theater notes, and by the International Classification of Disease code independently by DD and HS. This process identified 1960 patients as eligible for further analysis. From this cohort, 583 patients were randomly selected by randomly drawing from a pile of 1960 paper sheets (previously shuffled thoroughly for multiple times) each one coding for one patient for further telephone interview. The number of patients enrolled ("German military cohort") was determined as described before [17] to accumulate a minimum of 200 patients undergoing excision and primary closure technique, and 300 patients undergoing excision and primary open wound treatment. These are both common treatments at present and were in past decades as well. Primary endpoints were postoperative pain and recurrence-free survival at 5, 10, and 20 years following surgery. An a-priori power analysis for the specific numbers of samples could not be performed in detail due to the effects within the outcome variables (postoperative pain, recurrence) being unknown. However, based

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