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Original Article

The use of fibrin glue without surgery in the treatment of pilonidal sinus disease

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Abstract: Pilonidal sinus disease is a common disabling condition affecting the natal clefts of the buttocks. We analyze the role of fibrin glue in the treatment of selected patients with pilonidal sinus disease. Forty patients diagnosed with pilonidal sinus disease at Vakif Gureba Training and Research Hospital were treated between December 2007 and December 2011. Recurrence was noted in four patients (10%). Ninety percent of patients had no recurrence one year later (95% confidence interval: 0.85-0.95). This procedure is suggested as a first line of treatment for patients with no prior history of infection and who have only one sinus orifice.

Keywords: Fibrin glue, pilonidal sinus

Introduction

Pilonidal sinus (PS) disease is a common disabling condition affecting the natal clefts of the buttocks. It is accepted as an acquired disease that results from the penetration of shed hair shafts through the skin. PS occurs with an incidence of about 26 per 100,000 population and occurs mostly in young males, with a ratio of approximately 3 or 4:1 (male:female) [1]. Although it affects mainly the most active portion of society, creating a considerable health and economic burden, the best disease management stragety for PS remains unclear. A variety of operations have been described: from minimal surgical methods including phenolization of the track, simple excision, laying open, marsupialization, elliptical, medial or paramedial excision and primary closure, to complicated flap procedures such as rhomboid and rotation, amongst others [2].

The ideal management stragety should be simple with minimal tissue loss and a low recurrence rate. Furthermore, both shorter hospital stay and post-operative disability from active life should be minimal, with low cost and high cosmesis. Therefore, simple methods such as pit excision and the mechanical clearance of sinus, as well as chemical treatments, have gained greater acceptance in the management of PS.

Fibrin glue has been used for three decades in many fistular diseases with varying success. It has been applied in enterocutaneous fistulas, repairing dura tears, bronchial fistulas and for achieving hemostasis after spleen and liver trauma [3]. It is also been employed in “no sutures” corneal transplantation [4]. The use of fibrin glue in PS is relatively new and encouraging results have been reported. The glue promotes healing with an excellent cosmesis and minimal tissue loss, without excision of large amounts of tissue [5]. Here, we aimed to analyze the role of fibrin glue in the treatment of selected patients with PS disease.

Material and methods

The selected patients had been diagnosed with PS disease in Vakif Gureba Training and Research Hospital between December 2007 and December 2011. The selection criteria had been previously established and patients were evaluated for the management options with a

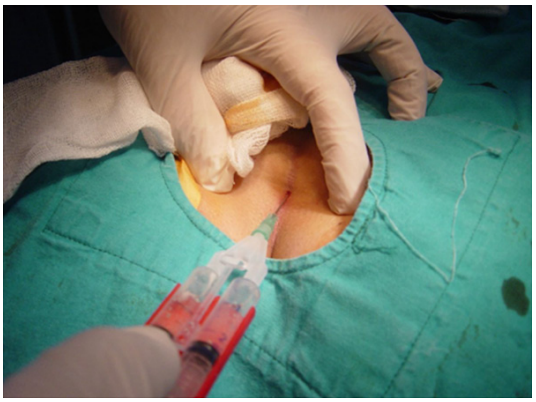

Figure 1. Fibrin glue enjection.

senior consultant surgeon (AI, RE). Patients with only one sinus tract, with no previous sinus infection, no medical and surgical treatment for PS disease or abscess, and without recurrences were selected. Instances of two or more sinus tracts were considered complicated diseases and patients were excluded from the study. Informed consents were obtained from all patients. The study was approved by the institutional board of the hospital. A thorough medical and social history including the hygiene habits were obtained. The procedure was performed under local anesthesia with the patient lying prone. Antibiotic prophylaxis was given before the procedure. Iodine antiseptic solution was applied on the shaved skin of the buttocks and sterile drapes were used to expose the natal cleft. The depth of natal sulcus was measured and noted. The sinus contents including hair and granulation tissue were completely cleared by stylet through the sinus orifice superiorly. Care was taken to extract all debris from the sinus to avoid remaining hair and granulation tissue after the glue is injected, which could potentially lead to further acute infection. Fibrin glue (2-4 ml, Tissell) was then injected through the PS opening to the sinus bed to obliterate the dead space (**Figure 1**). The skin was then pressed gently onto the sacrococcygeal fascia and pressure was maintained for 2 min, until the glue was dry. A compressive dressing was applied to the area for 24 h, and thereafter small gauze was used to keep the wound covered. The patients were kept in observation for 1 h after the procedure before being discharged with oral analgesics that were prescribed for the first few postoperative days. Hygienic advices for the gluteal region were given to all patients at the discharge time. They were instructed to return to normal daily activities as soon as they felt comfortable. All patients were invited to the clinic for a follow-up visit at post-operative weeks 1, 2 and 4, as well as 6 and 12 mo after the procedure. A prospective database was kept for the demographic features, hygienic history, clinical conditions and their follow-up visits, and the data were evaluated retrospectively. The duration between the operation and the last visit (clinic visit with close examination) was noted as follow-up time. Recurrence was defined as the presence of any persistent purulent/blood stained discharge from the previously operated or nearby area during the follow-up time.

Results

Forty patients with PS disease, 32 males (80%) and 8 females (20%), were treated by this technique. The median age was 24 (range, 16-50 y). Thirty (75%) of these patients had hairy body structure. The mean natal sulcus length was 4 cm. Thirty (75%) of the patients had family history of PS. Ten patients have a bath every day, with the remaining bathing multiple times in a week. The mean duration of operative time was 15 min. Twenty-five patients experienced light pain during the procedure, 22 patients had induration in the operation field (55%), and 7 had both complaints. The mean time period for returning to their daily activities and work was 2 ± 1 d. The median follow-up time for all patients was 18 mo (range, 12-36 mo). The recurrence of disease was noted in four male patients (10%). In one case recurrence was on the forth postoperative week, and in the remaining 3 patients at twelve weeks post-operation. There were no other complications. Freedom from recurrence at 1 y was 0.9 (95% CI 0.85-0.95) (**Table 1**, **Figure 2**).

Discussion

PS has long been studied on an embryologic basis by many authors who considered a congenital origin [6]. Patey and Scarf, soon after the end of World War II, hypothesized that the disease was acquired by the penetration of hair into subcutaneous tissue, with consequent granulomatous reaction. They introduced this concept based on the high incidence of recurrence after complete excision of all tissue overlying the sacrum and on the occurrence of the

Table 1. Database including demographic variables and surgical technique results

Patient number	Body structure	Natal sulcus lenght (cm)	Fimily history	Everyday bath	Operation-time (minutes)	Light-pain	Indura-tion	Daily avtivity time (day)	Recurrence time (week)
1	H	3	+	-	10	+	-	1	-
2	H	4	+	+	15	+	-	1	-
3	H	4	+	-	15	+	+	1	-
4	H	1	-	-	15	+	-	2	4
5	N	8	-	-	20	-	+	2	-
6	H	2	+	-	20	-	+	3	-
7	H	7	+	-	15	-	+	2	-
8	N	6	+	-	10	+	-	2	-
9	H	4	+	-	15	-	+	2	12
10	H	4	+	-	15	+	+	2	12
11	H	3	-	-	15	+	-	2	-
12	N	2	+	-	15	+	-	1	-
13	H	3	-	-	20	+	+	2	-
14	H	2	+	+	10	+	-	3	-
15	H	2	+	-	15	+	-	3	-
16	H	3	-	+	15	-	+	2	-
17	H	4	-	-	10	+	-	2	-
18	N	4	+	-	15	+	+	2	-
19	H	4	+	-	15	-	+	3	-
20	H	1	+	-	10	-	+	1	-
21	N	7	-	-	15	-	+	2	-
22	N	3	+	-	20	+	+	2	-
23	N	3	+	+	15	-	+	2	-
24	H	3	+	+	15	-	+	2	-
25	H	3	+	+	20	+	-	2	-
26	H	3	+	-	20	-	+	2	12
27	H	4	+	-	20	+	-	3	-
28	H	2	+	-	15	+	-	1	-
29	H	7	+	-	15	+	-	2	-
30	H	5	+	-	15	-	+	2	-
31	H	6	+	-	15	+	+	1	-
32	H	3	+	-	15	+	-	2	-
33	H	3	-	-	10	+	-	2	-
34	H	4	-	+	10	+	-	3	-
35	H	4	-	-	20	-	+	2	-
36	H	4	+	-	20	-	+	2	-
37	N	4	+	-	10	-	+	2	-
38	N	2	+	+	15	+	+	1	-
39	N	3	+	+	15	+	-	1	-
40	H	4	+	+	15	+	-	1	-

H: hairy; N: normal.

disease in other locations of the body [7]. On the basis of this theory, incision and curettage has been proposed as the method of choice for PS treatment [6]. According to Karydakis, three main factors contribute to the hair insertion process: 1) the invader, consisting of loose hair, 2) some force, which causes hair insertion, 3) the vulnerability of the skin. If these three main

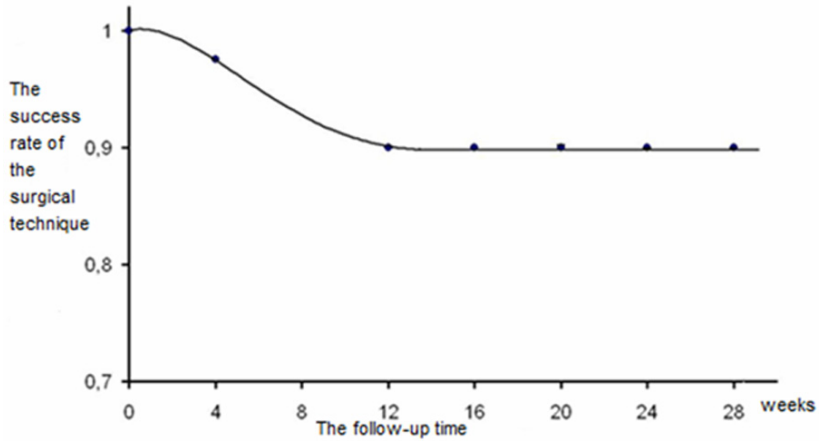

Figure 2. Freedom from recurrence.

factors occur, then hair insertion and PS results. Thus, for treatment and prevention of PS, these causative factors must be eliminated [8]. Armstrong and Barcia, advocating a conservative treatment with no excision but meticulous hair control by natal cleft shaving, showed that improved perineal hygiene and limited lateral incision produce good results [9].

Fibrin glue is a biological adhesive that imitates the final stage of coagulation. It is composed of purified, virus-inactivated human fibrinogen and thrombin. It stimulates the normal clotting process and is subsequently resorbed by normal tissue enzyme systems, without causing foreign-body reaction or extensive fibrosis. It has been used for hemostasis in the fields of plastic, cardiovascular and thoracic surgery, neurosurgery, otorhinolaryngology, orthopedic surgery, and dental care in patients with normal or abnormal hemostasis [10]. In attempts to reduce healing time and minimize tissue excision, fibrin glue has been used to treat PS disease. Vitale et al. first reported the use of fibrin glue in PS disease after the excision of sacrococcygeal fistula to fill the cavity [11]. Greenberg et al. later combined fibrin glue use with excision, making a curved skin incision and elevating a thick skin flap, before completely excising the sinus and all its extensions, and approximating the flap back to its original place. Finally, injection of 2-4 ml of fibrin glue was made through the original PS opening to hill the dead space under the skin flap. Treatment of 30 patients by this approach found no recurrence after approximately 2 y [12]. Seleem and Al-Hashemy have used fibrin glue after excision of a minimal amount of skin and subcutaneous tissue in 25 patients [13], while Lund and Leveson used the glue after excision of the epithelium of the sinus [14]. Altinli et al. compared two groups of patients to study the effect of fibrin glue on the eliminatioın of drain use after Limberg flap surgery and found that drains may have been avoided with fibrin sealant [15].

Our study is the first to show the use of fibrin glue without surgery. We intended to close the dead space of PS after the curettage by the help of fibrin glue. We hoped to treat PS without the requirement of surgery through the elimination of dead space by fibrin glue. Without excision, this non-invasive treatment is easy and simple to perform. It can be performed under local anaesthesia, does not require much medication or long hospital stay, has minimal post-operative disability and the operation may be performed by surgeons who are less experienced. It has good aesthetic results without disfiguring scars, saving the natural and deep shape of the anal cleft. The patients with only one sinus tract, with no previous sinus infection, no medical and surgical treatment for PS disease or abscess, and without recurrences were selected. Two or more number of sinus tract, previous sinus infection, and recurrences were considered complicated diseases and those patients were excluded from the study. Complicated diseases were treated by excision and Limberg or Karydakis Flap technique. The experience of light pain and enduration pain may be due to analgesic injection. Early returning to work was one of the identified major advantages of this procedure. A recurrence rate of 10% is comparable to other procedures, such as excision and karydakis or Limberg flaps [16]. As this technique is novel, recurrences may decrease as further experience is gained.

In conclusion this procedure is suggested as the first-line treatment of patients who have no history of infection and only one sinus. As this was a retrospective single arm study with no control treatment, further randomized prospective studies should be conducted to better eval-

ute the role of fibrin glue application for treatment of PS. In a forthcoming randomized prospective study with control treatment groups, we are planning to expand inclusion criteria such as no restriction for infection history and sinus orifice number.

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Disclosure of conflict of interest

None.

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