Approach To Interdigital Pilonidal Sinus – Extended case report and literature summary

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\textbf{LITERATURE SUMMARY}
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\textbf{ABSTRACT}

\textbf{Introduction:} Interdigital pilonidal sinus disease, also called “Barber’s Disease,” is an acquired occupational disease. It is much less prevalent than sacrococcygeal pilonidal sinus disease and it occurs between the fingers and toes.

\textbf{Methods:} Two new cases are reported. 50 cases were identified through a PubMed search.

\textbf{Results:} Incidence of this disease is not known. It is caused by the penetration of newly cut, short, and sharp hair through interdigital skin. Surgical excision and primary closure is the accepted treatment.

\textbf{Conclusion:} Because of the complex structure of the hand, preoperative determination of excision margins is important. It is thought that protective measures may be of some benefit in preventing this occupationally acquired disease. Surgical treatment of interdigital pilonidal sinus disease is reviewed.

\textbf{Keywords:} pilonidal sinus, surgery, interdigital, hair.

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\textbf{INTRODUCTION}

Templeton first defined the histological structure of Interdigital Pilonidal Sinus Disease (IPSD) as a foreign body granuloma in 1942 (1-4). Although this disease was mostly seen in barbers, hence the term Barber’s disease, it has also been described in dog walkers, floor-makers, milkmen and shearers. IPSD has also been called “sheep shearing disease” and “milkman’s granuloma” and occurs due to dog and goat hairs penetrating via the same mechanism (5-9). Although there are almost 50 case presentations in the literature about IPSD, there is no extensive study on this disease (10-15). In this study, we aim to review Barber’s disease in the context of our clinical experience by gathering published studies.

\textbf{METHODS}

PubMed search engine was used to identify publications on interdigital pilonidal sinus disease and its colloquial terms. No studies were excluded.

\textbf{RESULTS}

50 cases were identified. Two new cases are presented.
DISCUSSION
Pilonidal sinus disease typically occurs in the sacrococcygeal region but can rarely be seen in the interdigital spaces, penis, scalp, axilla, abdomen, neck and inguinal regions (16-25). Today, IPSD is accepted as an occupational disease among barbers. Other than in the interdigital spaces, hair can rarely penetrate via the finger pulp, palm, periungual or subungual regions. IPSD can rarely occur in feet and is thought to occur in the setting of wearing sandals while working. There are only two cases regarding this subject in the literature. IPSD can occur in different regions of the same patient. Jochims and Brandt presented a case of pilonidal sinus in all interdigital spaces of both hands (26-28).

We have encountered two patients with interdigital pilonidal sinus. One was a 7-year barber with a pilonidal cyst in the extensor surface of the third finger on the right hand (Figure 1). The other patient was a 25-year barber who underwent surgery for IPSD in the first interdigital space of his right hand in 2003, the second interdigital space of his left hand in 2007, and the second interdigital space of his right hand in 2011. His fourth IPSD occurred in the third and fourth interdigital spaces of right hand (Figure 2). Even though the number of females working with men’s hair has recently increased throughout the world, traditionally male barbers comprise the main patient population (29). Patel et al. examined 24 cases included in the literature and showed that all occurred in males (25). Three separate cases have been described in the hands of females working as professional dog walkers (5,6,8).

Hair samples collected in cases in the literature have different colours and different thickness. Contrary to other pilonidal sinuses, IPSD does not contain the patient’s hair (e.g. sacrococcygeal, umbilical, chest wall, anal cannal, ear and scalp (22,29-31)). IPSD results from short, thick and sharp hairs that penetrate into interdigital skin and forming a sinus and then a (pseudo)cyst. Accumulation of hairs results in classical pilonidal disease. Main symptoms of this disease are hair fragments in inflamed cyst, pain, swelling, redness and purulent discharge (29-33). Pilonidal sinuses generally progress asymptomatically. Many

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which are not occupational may not be noticed by patients. As the disease may be asymptomatic, patients mostly do not seek treatment and the incidence of disease is not known. Poor awareness about IPSD by doctors contributes to the unknown incidence (29,34,35). Currie et al. found the rate of IPSD was almost 13% among male barbers. Likewise, a 13% prevalence rate was found in another study of barbers (17,32). Both these studies were carried out in 1950’s and unfortunately there are no current data.

The main reason why IPSD is seen mostly in male barbers serving male clients may be due to hair type. Shorter, thicker, harder and sharp hair of males makes the penetration easier. As female hair is mostly long, thin and soft, these cannot easily penetrate into interdigital spaces (7,29,36). Even if healthy skin generally provides protection against physical and environmental factors, there are situations where hairs can penetrate into healthy skin. Firstly, cutting hair changes its characteristics. Hair can become sharp as a needle. Secondly, as hair is cut in the humid environment of a barbershop it becomes electrostatic with greater adhesive characteristics. Thirdly, the occurrence of cuticles in tiles gives hook characteristic to hair. Moisturizers and shampoos used routinely by hairdressers may accumulate and irritate the thin interdigital epidermis (37). The histological studies show hair fragments penetrating into skin were surrounded by unspecified inflammatory infiltrate and a foreign body granulomatous reaction (32,37-39) (Figure 3).

Figure 3. Histopathology

Figure 4. Intraoperative methylene blue

Other significant complications of IPSD (in addition to recurrence as is typical of pilonidal sinus disease) are abscess formation, fistula formation, cellulitis, lymphangitis and osteomyelitis (5,8,40-42). Additionally, phalyngeal osteomyelitis has been reported (20,22).

There is no consensus about the treatment of IPSD. In 1955, Powell stated that routine precautions remained insufficient. Traditional approaches such as removing hairs from the sinus, drainage of discharge and administering antibiotics are ineffective. In the literature reviewed, total excision of sinus tissue is accepted as an effective treatment method (5,29,39,43-45). Additionally, Schröder et al. presented their opinions in a case that the disease can be completely treated by excising embedded hairs (46).
Surgical factors to prevent recurrence are unknown. Therefore, preoperative or intraoperative good determination of surgical limits is vital in order not to cause functional compromise resulting in the patient not being able to work. Extent of excision may be determined by probing depth and by methylene blue injection during surgery (29,36) (Figure 4). If the extent of disease cannot be determined, fistulography may be performed (29). Imanishi et al. reported that Ultrasonography together with thorough history taking and physical examination increases the diagnostic accuracy of IPSD and may help determining the surgical margins required to completely eliminate the disease (47).

During surgery thorough haemostasis is required for visualizing the complex anatomical structures in the hand. Surgery under local anaesthesia in interdigital region does not permit sufficient haemostasis and the resultant oedema prevents surgical exposure. Tourniquet anaesthetic techniques such as regional intra venous anaesthesia (RIVA) are preferred as these allow sufficient haemostasis and a comfortable and safe surgery (48-50).

Uniform opinion is that the cyst is excised and then primarily closed (Figures 5 and 6). Even though it was stated that secondary healing had lower recurrence rate after cyst excision, scar tissue formation, scar and long healing periods were seen as disadvantages (5,25,29,30,36,44,51). Efthimiadis et al. suggested that surgical excision, curettage and primary closure would be a safe method in the treatment (52). Sacrococcygeal pilonidal sinus excision and off midline repair by the use of a flap is now routine. Some authors writing on IPSD note a rotation flap results in a good results but others state that flap repair should only be used to repair defects occurring in fistulised, recurrent cases or after large excisions (29,36,53-55).

Although sacrococcygeal pilonidal sinus disease is renowned for its high recurrence rate, the recurrence rate of IPSD is unknown. Patel’s series documents two recurrent cases out of a series of 24 (25). Limited excision of IPSD may preferred to wide excision: lower recurrence rate, shorter healing and preserved function. Soll et al. suggest for sacrococcygeal pilonidal sinus disease that sinusectomy was a significant

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alternative to flap and secondary wound healing methods (56). In our clinic, excision and primary closure operations were performed for both patients with IPSD and there has been no recurrence. Even though patients complained about skin tension in the early period, we observed that this cleared up within two weeks.

IPSD (Barber’s Disease) by virtue of occurring in the hand is associated with more complex anatomy than pilonidal sinus disease occurring in other sites. Therefore, the surgeon needs good knowledge of hand anatomy. In IPSD, deep and superficial transvers metacarpal ligaments, digital veins and nerves, extensor mechanism are at risk as excessive tissue resection may result in damage. It should be considered that transverse metacarpal ligament damage results in intermetacarpal and metacarpophalangeal joint instability, digital vasomotor nerve injuries resulting in superficial necrosis to gangrene and neurological deficits from hypoesthesia to total axonal degeneration can occur (57-59).

Prevention of occupational diseases is preferred to surgical cure. Researches recommended taking precautions such as regular cleaning of interdigital regions, eliminating the cut hairs, using protective creams, wearing open-ended gloves during work and washing hands after each hair cut (27,29,36,60). One of our cases was a 25-year barber. This patient in whom IPSD developed in different regions of both hands in different periods stated that he used gloves and protective creams even if these made his job difficult especially after his second operation in 2007. However, the disease developed in two different interdigital spaces every three years. As such, protective precautions mentioned in the literature may not be effective. Interestingly, in this patient recurrence was not observed but the disease occurred in other regions. Granulation tissue occurring in wound after surgery turns into fibroblasts, intensive collagen bundles, elastic tissue fragments, extracellular matrix and scar tissue (61). It may be that cut hairs cannot easily penetrate into the postsurgical scar in the interdigital skin which is otherwise thinner than in other regions of the body.

IPSD is an acquired, rare, possibly avoidable occupational disease that prevents patients from working until complete recovery. Preoperatively the surgeon needs to determine the excision boundaries and intraoperatively to avoid trauma to underlying structures. Although primary closure after IPSD is the most common treatment method, a flap may be required in the presence of a fistula or recurrence.

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