HAIR TOURNIQUET SYNDROME

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ABSTRACT

Objective: *To find out the causes and sites involved of hair tourniquet syndrome in our setup.*

Methodology: *This descriptive study was conducted in Surgical units of Agency Headquarter Hospital, Landikotal and Govt. City Hospital, Peshawar from 2007-2011. Fifty consecutive cases of hair tourniquet syndrome of both sexes were included. Data was collected on a pre designed proforma regarding the patient's age, sex, family background, socio-economic status and possible causes of this unique entity by interviewing the parents, relatives, spiritual healers, paramedical staff and quacks. Site involved was determined by clinical examinations in the OPD, ward and in operation theatre under sedation. Data was analyzed using SPSS version 16.*

Results: *Out of 50, 38(76%) were male and 12(24%) were female. In 30(60%) patients, glans penis were involved, while other parts involved were digits (hand and foot) in 12%, skin tags in 11(22%), umbilical hernia in 2(4%), meningocele in 1(2%). In 28(56%) cases, no cause was found, especially in infants. Other causes were for the management of nocturia in 12%, amputation of skin tags in 10% and post circumcision bleeding, spiritual healing and jealousy each in 6% patients. Human hair was found in cases of infants and children while in adults animal hair was used.*

Conclusion: *Outcome of Unnoticed and missed hair coils around skin appendages can be devastating in shape of strangulation and amputation whether the cause is known or not.*

Key Words: *Hair, Tourniquet, Hair tourniquet syndrome (HTS), Child abuse.*

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INTRODUCTION

Hair was and is a symbol of strength, religious beliefs and cultural affiliations. Mankind has used its mechanical, physical and biological properties in various shapes since prehistoric era. Oldest medical use of hair is mentioned in Hindu literature. Muslim physicians like Avicenna and Albucasis has mentioned its uses like suturing and hemostasis. Like any symbolic thing its uses and misuses are not uncommon.

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Hair tourniquet syndrome HTS, an uncommonly recognized condition has gradually gained recognition since it was first described in1612 as Hair-thread tourniquet syndrome when a hair was found to be a strangulating agent of glans penis[1, 2]. The term hair tourniquet syndrome HTS was coined by Barton et al in 1988. The Lancet officially published a case as early as in1832 and has subsequently been well established in medical literature[3, 4]. Human hair is extremely thin and therefore, easily overlooked, especially when there is a foreign body reaction and local swelling. Hair has a tensile strength of greater than 29,000 pounds per square inch. It also stretches when wet, and contracts and tightens as it dries. These characteristics make it excellent agent for intentional constriction[5, 6].

Hair tourniquet is a clinical phenomenon that involves hair or thread becoming so tightly wrapped around an appendage that it results in pain, injury, and sometimes loss of appendage. The syndrome is most likely to involve a finger, but other appendages may be involved, such as a toe, wrist, penis, tongue, clitoris, ear lobe, umbilicus or nipple[7]. The wrapping of the offending fiber or hair around a digit is

thought to be caused by repetitive movement of the limb such as hands in mittens or feet in pajama[8].

Majority of cases of hair wrapping occurs in young children, with one study quoting the mean age as 5.5± 4 months, digital wrapping is higher in those aged between 4 days to 19 months and penile wrapping is higher in those aged 4 months to 6 years.[2] Labial and clitoral wrapping have been described in an older age groups (7-13 years)[9, 10].

A review of 66 cases of hair- thread tourniquet syndrome has been reported, 43% involved the toes, 24% involved the fingers and 33% involved external genitalia[2].

HTS has been associated with postnatal telogen effluvium, which 90% of women experience at peak between 2 and 6 months after giving birth[11, 12]. Some authors have suggested that genital involvement can be secondary to 'stratification disorder' or 'infantile masturbation' that is general self-exploration, especially considering that masturbation occur in 90 to 94% of male and 50 to 60% of females[13, 14].

There is delay of 3 to 4 days before the condition is recognized, and patients may delay presenting due to embarrassment particularly when the genitals are involved[15]. Discrete annular constriction frequently goes unnoticed and the skin is slowly penetrated, with neoepithelization occurring over the offending hair and thus making the diagnosis progressively more difficult[11].

The aim of this study was to find out the causes and sites of involvement Hair tourniquet syndrome-HTS. Furthermore there is no local data available in this respect, so the results of this study will generate local statistics.

METHODOLOGY

This observational descriptive study was conducted Agency Headquarter Hospital Landikotal and Govt. City Hospital, Peshawar from 2007-2011. A total of 50 cases of all age groups and both sexes were included in the study. All cases were diagnosed on the basis of history, clinical examinations in OPD and ward. In difficult diagnosis the cases were examined under sedation in operation theatre and final diagnosis was made. After diagnosis, we conducted intensive interviews with the parents, patient itself (where possible), relatives, and health workers; spiritual healers to sort out the cause of HTS and sites involved were noted by physical examination. Data was collected on proforma and was analyzed by SPSS 16.

RESULTS

A total of 50 patients were included in the study, of which 38(76%) were male and 12(24%) were female. The age range was 14 days to 25 years. Body parts involved were glans penis 30(60%), while other parts were digits (hand and foot), skin tags, umbilical hernia, meningocele. (Table.1 and photos 1 to 9)

In 56% of the cases no cause was found even after intensive search especially in infants while in the rest of cases (i.e., 44%) causes are listed in Table-2.

We found that the human hair was main culprit in cases of infants and children while in adults animal hair was the offender.

Child abuse and negligence are the two main causes of Hair Tourniquet SyndromeHTS in infants and children, while in adults hair are intentionally applied for different ailments like pedunculated skin lesions(congenital/acquired) and sometimes for visceral problems (as advised by spiritual and magic healers).

Table 1: Sites of involvement

Sites	Number (Percentage)
Glans	30 (60%)
Digits (finger, toes)	6 (12%)
Umbilical hernia	2 (4%)
Skin tags (congental/acquired)	11 (22%)
Meningocele	1 (2%)

Table 2: Causes of Hair Tourniquet Syndrome

Causes	Number (Percentage)
Unknown	28 (56%)
Nocturia (enuresis)	6 (12%)
Post circumcision bleeding	3 (6%)
Jealousy	3 (6%)
Spiritual healing/Fun	3 (6%)
Amputation of skin tags	5 (10%)
Accidental by mothers hair	2 (4%)

Figures 1 and 2: Urethral fistula as a result of hair applied for nocturia/enuresis

Figure 3: Thumb tourniquet

Figures 4 and 5: Penile tourniquet

Figure 6: Hair coil embedded at the base of penis

Figure 7: Umblical tied by animal hair by spiritual healer

Figure 8 and 9: Animal hair intentionally applied to remove the lesions

DISCUSSION

HTS is circumferential strangulation of an appendage by human hair. The mechanism of injury is the impairment of lymphatic flow to start with followed by obstruction to venous out flow and then impairment of arterial inflow. This is an emergency condition that causes progressive edema, ischemia, and tissue necrosis and can lead to auto amputation of the affected part. Sometimes the cut through is partial and the cutting band may be embedded under the skin making circumferential nodule[2].

Hair wrapping of digits is not uncommon in children and generally not well known to pediatricians/ emergency room physicians who usually attend these patients initially. It has been confused with infection, trauma, congenital fibrous bands and other related problems of affected part. In our study bulk of objects were children having mean of age 2 years, as it is observed in other studies[16- 18].

Consensus to the cause of this condition in the literature is that this is not intentional injury that may be true as no cause was found in 56% of our cases[9, 18]. Suggestion of child abuse has also been given because of lack of reasonable explanation and the meticulously wrapping of the tourniquet. Child abuse by the jealous female relatives of a male child was seen in 10% of our cases[9, 18-21].

HTS involving the glans mostly occurs in circumcised boys, because hair is fine and lies in a groove between glans and carpora. As the inflammation occurs it further masks the coil of hair and the condition can be easily missed if not in the mind of attending doctor. The hair can become trapped in the groove and overlying skin can heal thus leaving a recurrent discharging sinus, nodule or urethral fistula.

We also report 12% of cases in which the hair was tied intentionally to prevent bleeding (post circumcision), nocturia in children and later the event was forgotten. This type of HTS caused injury is not mentioned elsewhere in literature. Invariably the source of hair was from mother and was tied by faith healer.

HTS involving digits, skin tags were seen in 40% of cases. Although no cause could be found in 65% of the studied cases, It is noted however that this condition is commoner in toddler when a child is just learning to walk and is more prone to accidental tourniquet by hair and other synthetic fibers. All the hair removed (from infant's pathologies) was compared with the mother head hair. Strahlman established a link between telogen effluvium (a post partum condition in which there is increased maternal hair loss) and HTS[12]. In all cases possibility of non-accidental cause of injury should be born in mind, although most appear to be inadvertent. Pieces of jump suits and mitten with loose nylon threads have been identified as source of the ligature.

Skin tags and papilloma have been removed by application of strong horsetail hair and still practiced in rural population by barbers, faith healers and persons himself. The progressive edema, ischemia and strangulation lead to necrosis of the said pathologies.

Outcome can be disastrous when similar attempt is made by quacks on lesions like meningocele and umbilical hernia. This was seen in 10% of our cases.

Majority of the patients (52%) presented with

swelling, erythema and a circumferential scar with typical edema. All patients were treated by immediate removal of the constricting hair coil. A simple vertical incision over the strangulation was given to remove the constricting band of hair. At times early ligatures can be removed by application of depilatory cream applications and thus unwinding the hair coil[22]. Hair is chemically inert and increased duration of the tourniquet can lead to serious complications like urethral fistula, strictures, gangrene, penile deformities and patient may end up with amputation of affected part. Prompt diagnoses and treatment is necessary to prevent these complications[23- 26].

Myths, magic/spiritual healing is common in rural as well as in urban population. Whether they work or not, but one fact is established that mechanical effects of hair does produce results either way happy or disastrous when tied around skin appendages.

CONCLUSION

Unnoticed and missed hair coil results in very devastating outcomes like strangulation and amputation whether cause is known or not. Glans penis and skin tags were the most common sites involved. A continuously crying baby should be thoroughly examined for swollen acral part to rule out this entity. Our emphasis is that health educator; emergency room doctors and pediatricians should have knowledge of this entity, which is not uncommon. Mothers and general population should be educated about this preventable trauma, which is caused by negligence and ignorance.

REFERENCES

1. Golshevsky J, Chuen J, Tung PH. Hair thread syndrome. J Pediatr Child Health 2005;41:154-5.

2. Barton DJ, Sloan GM, Nichter LS, Reinisch JF. Hair- thread tourniquet syndrome. Pediatrics 1988;82:925-8.

3. Abel MF, McFarland R. Hair and thread constriction of the digits in infants: a case report. J Bone Joint Surg Am 1993;75:915-6.

4. Klusmann A, Lenard HG. Tourniquet syndrome --- accident or abuse? Eur J Pediatr 2004;163:495-8.

5. Alpert JJ, Filler R, Glaser HH. Strangulation of an appendage by hair wrapping. N Eng J Med 1965;273:866-7.

6. Summers JL, Guira AC. Hair strangulation of the external genitalia: report of two cases. Ohio State Med J 1973;69:672-3.

7. Peckler B, Hsu CK. Tourniquet syndrome: a review of costricting band removal. J Emerg Med 2001;20:253-62.

8. Bothner J. Hair entrapment removel techniques Online. 2003 cited on 2011 February 4. Available from URL: http://www.uptodate.com/contents/hair-entrapment-removal-techniques

9. Claudet I, Pasian N, Debuisson C, Salanne S, Rekhroukh H. Tourniquet syndrome: interest of systematic analysis of families social conditions to detect neglect situations. Child Abuse Negl 2009;33:569-72.

10. Bacon JL, Burgis JT. Hair thread tourniquet syndrome in adolescents: a presentation and review of the literature. J Pediatr Adolesc Gynecol 2005;18:155-6.

11. Garcia-Mata S, Hidalgo-Ovejero A. Hair tourniquet syndrome of the toe: report of 2 new cases. J Pediatr Ortho 2009;29:660-4.

12. Strahlman RS. Toe tourniquet syndrome in association with maternal hair loss. Pediatrics 2003;111:685-7.

13. Alverson B. A genital hair tourniquet in a 9 years old girl. Pediatr Emerg Care 2007;23:169-70.

14. Leung AK, Robson WL. Childhood masturbation. Clin Pediatr (Phila) 1993;32:238-41.

15. Bacon JL, Burgis JT. Hair thread tourniquet syndrome in adolescents. A presentation and review of the literature. J Pediatr Adolesc Gynecol 2005;18:155-6.

16. Mackey S, Hettiarartchy S, Dickinson J. Hair tourniquet syndrome toes and bilaterally. Eur J Emerg Med 2005;12:415.

17. Leferink VJ, Klaase JM. Toe tourniquet syndrome. Ned Tijdschr Geneeskd 1997;141:2499-501.

18. Biehler JH, Sieck C, Bonner B, Steumky JH. A survey of health care and child protective service provider knowledge regarding the toe tourniquet syndrome. Child Abuse Negl 1994;18:987-93.

19. Soliman SM, Hafie E, Hassan TA, Hamza AF, Hay SA, Bassiouny IE. Hair coil induced penile tourniquet injury. Saudi Med J 2003;24:55.

20. Klusmann A, Lenard HG. Tourniquet syndrome--- accident or abuse? Eur J Pediatr 2004;163:495-8.

21. Kirtane JM, Samuel KV. Hair coil strangulation of the penis. J Pediatr Surg 1994;29:1317-8.

22. Stock C, Wang LC, Spigland NA. Untangling a web: an usual case of labial necrosis in an adolescent female. J Pediatr Adolescent Gynecol 2012;25:21-2.

23. Vazquez Rued F, Nunez Nunez R, Gomez Meleno P, Blesa Sanchez E. The hair thread tourniquet syndrome of the toes and penis. An Esp Pediatr 1996;44:17-20.

24. Ms S, Shamim M. Progressive hair coil of penis. J Coll Physicians Surg Pak 2004;14:636-7.

25. Haddad FS. Penile hair strangulation by human hair. Report of three cases and review of the literature. Urol Int 1982;37:375-88.

26. Nazir Z, Rasheed K, Moazam F. Penile constrictive band injury. J Pak Med Assoc 1993:43:135-7.

CONTRIBUTORS

SA conceived the idea, planned and wrote the manuscript of the study. MA assisted in the analysis and interpretation of data. MS supervised the study. All the authors contributed significantly to the research that resulted in the submitted manuscript.