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Review Article

STUDY OF *NIRUDDHA PRAKASH* WITH SPECIAL REFERENCE TO PHIMOSIS: A REVIEW

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ABSTRACT

In *Ayurvedic Samhita Niruddha Prakash* (phimosis) *vyadhi* (disease) is described to be formed because of vitiated *Vata Dosha* where constricted *Shishnacharma* (prepuce) covers *Mani* (glans penis). This creates obstructed, slow urine flow and the prepuce could not be retracted. Treatment described in Ayurvedic epics is dilatation of preputial meatus by *Niruddhaprakash Nadiyantra* and *Vatadosh Shamak* medicated *tail* (oil) *Parishek* (fomentation). Surgery is advised if this measure fails. *Niruddha prakash* has similar features to that of phimosis described in modern medical science. Recent researches shows that glans penis and prepuce has common epithelium and its complete separation essential for complete prepitual retraction exposing whole of glans may normally occur up to the age of 17 years. This may lead to wrong diagnosis of phimosis. Circumcision is considered as treatment of choice for phimosis. In this review article efforts have made to analyze description of *Niruddha prakash* in *Ayurved* Epics, and recent researches regarding development and separation of prepuce, non surgical treatment of phimosis for bypass of surgical and anaesthetic complications, and surgical procedure with less complications compared to circumcision that will preserve prepuce as it is important structure protecting glans and urethral meatus and also for coital pleasure.

INTRODUCTION

Foreskin cutting also called male circumcision is done most commonly worldwide as religious, cultural, medical, personal preference and several other reasons. An estimated one third of males are circumcised globally.(1) Phimosis is the most frequent medical reason for male circumcision where a stricture of the foreskin narrows the opening and prevent it from being retracted to uncover the glans. *Ayurveda* is considered as great ancient medical treatise. *Ayurvedic Samhita* describes a *Vyadhi* (disease) *Niruddha Prakash* having similarity to Phimosis. On account of morbidity and mortality of circumcision operative procedure and anaesthesia, the review study of *Niruddha Prakash* and its treatment described in Ayurveda classics gains much importance. Similarly the study of development and separation of prepuce and conservative treatment also becomes important.

MATERIALS AND METHODS

In this study the references has been collected from different *Ayurvedic Samhita* and their commentaries, modern medical text books, and published research articles. All matter has taken for discussion to draw some conclusion.

Niruddha prakash (Phimosis) in *Ayurveda* classics

Sushrutacharya includes *Niruddha prakash* (Phymosis) in *Kshudra roga*.(2) In *Astanga Samgraha* it is described as *Niruddhamani* and included in *Guhyaroga* (diseases of genitals).(3) *Vatadosh* vitiated *Shishnacharma* (prepuce) covers *Mani* (glance) and occludes *Mutrasrota* (route of urine flow). This creates *Mandadhara* (slowed down urine flow) without pain. Here *Mani* (glans) is always covered with *Charma* (prepuce), this painful disease is *Niruddha prakash* and is formed because of vitiated *Vata dosha*.(2) *Madhukosha* description says this disease is also formed if scar of *Avapatika* (prepusal tear) disease is not heeled properly.(4) *Astanga Samgraha* describes *Vata* vitiated *Charma* (prepuce) adheres to front of *Mani* (glans) creating obstruction to urine flow. Here slow urine flow

is present without pain and *Mani* (glans) could not be uncovered, this disease is *Niruddhamani* (phimosis).[3]

Treatment of *Niruddha prakash* (Phimosis) as described in Ayurvedic classics

Acharya Sushrut describes *Louha nadi* with openings at both the ends is applied with *Ghrit* to make it smooth, and then to penetrate it slowly in prepusal opening. Then *Mani parishek* is done with *Vasa*, *Majja* of crocodile and pig as well as *Vataghna* medicated *Chakratail*. After consecutive three days larger *Nadi* should be used in sequence. *Snigdha anna* should be given during this treatment. If this treatment fails then surgery can also be done preserving *Sevani* (frenulum) and it is treated as *Sadyakshata*.[5] *Nibandhasangraha* commentary of *Susruta samhita* describes *Chakratail* as *Yantrapidit tail*[6] meaning oil extracted by compressing machine. Similar treatment and surgery if needed is advised in *Astangahridaya*[7] and *Astangasamgraha*[8]

Nadiyantra

Different types of *Nadiyantra* are described in *Ayurvedic Samhita.* These are tube like instrument having opening at one or both the ends. These are used to remove foreign bodies from *Srotasa*, for observation like different speculum, for aspiration, director like fistula director etc. The thickness and length of this instrument is as required for meatus. *Niruddhaprakash yantra* (prepuce and urethral dilator) is described in *Sushrut samhita*.[9]

Niruddha Prakash can be correlated with the disease phymosis in modern medical science. As very limited description of *Niruddha Prakash* is seen in *Ayurvedic Samhita* Text, it creates need for study of phymosis from modern medical science regarding developmental anatomy of prepuce, pathology of phymosis, and its available treatment modalities.

Phimosis

Phimosis is stenosis of the prepitual orifice so that the foreskin cannot be pushed back to expose the glans penis.[10] The physiological adhesion between the foreskin and the glans penis may persist upto the age of 6 years or more. This lead it to be much overdiagnosed. In true Phimosis, the scarring of prepuce is present in small boys, which will not retract without fissuring. The tight prepuce may cause urinary obstruction. Masking of meatal atresia by tight prepuce causing urinary difficulty with residual urine may be present. This may create backpressure on ureters and kidney. Balanitis Xerotica Obliterans can cause phimosis in later life. In this the foreskin become thickened and will not retract, leading to problem with hygiene and increased susceptibility to carcinoma.[11]

Development and Separation of Prepuce

In fetus, the prepuce appears at eight weeks as a ring of thickened epidermis growing forwards from the base of glans penis. It grows more rapidly on upper surface than lower leaving the inferior aspect of preputial ring deficient. Pair of outgrowths are pushed out and meet from inferior aspect of the glans. These enclose a tube and become continuous with the existing urethra. The prepuce grows forwards to tip of the glans by 16 weeks. At this stage, the epidermis covering the glans is continuous with the epidermis of deep surface of prepuce and it consist of squamous epithelium. Later the squamous cells arrange themselves in whorls forming epithelial cell nests. The centers of these degenerate to form series of spaces. These spaces increase in size and link up to form preputial space. The separation of prepuce by the time of birth varies greatly. Gairdners observation in a series of 100 newborn revels only 4% with fully retractable prepuce, in 54% the glans could be uncovered enough to revel the external meatus, and in remaining 42% even the tip of the glans could not be uncovered.[12]

Work in Kayaba et al, they evaluated 603 Japanes boys 0 to 15 years old and classified prepitual status in 5 types: 1 type I - no retraction of prepuce at all, type II - exposure of external urethral meatus only, type III (intermediate) – exposure of glans halfway to the sulcus of the corona, type IV – exposure of glans to above the corona at the site of the preputial adhesion and type V -easy exposure of the whole glans. They defined a tight ring as a stenotic ring that prevented the prepuce from being retracted. They found that before age of 6 months the incidence of types I (completely unretractable) to V (completely retractable) prepuce was 47.1, 21.5, 29.4, 2 and 0% respectively. None of the 111 boys younger than 1 year with a type V prepuce. In the 3 to 4 year-old boys types I and V prepuce were in 6.2 and 16.5% respectively. The incidence of types I and II prepuce decreased from 68.6% at ages 0 to 6 months to less than 10% at age 5 years. Of the 11 to 15-year-old subjects the prepuce was type V in 62.9%, type IV in 11.4% and type I in none. A tight ring frequently found in infancy but the incidence also decreased with age.[13]

Examination of preputial development by Oster in 173 Danish boys 6 to 17 years old, monitored annually for 7 years, reported that the incidence of preputial adhesion decreased from 70% at ages 6 to 7 years to 5% at 16 to 17 years.[14]

These findings indicate that incomplete preputial separation is common and normal in neonates and infants, and prepitual separation processes until school age.

Anatomy of Prepuce

Mucosal epithelium - The mucosal epithelium of male prepuce is same as mucosal epithelium covering glans penis. The inner prepuce and glans penis share a common, fused mucosal epithelium at birth. **Lamina propria of preputial mucosa**- it has loose collagen and it is very vascular leading to common haemorrhagic complications associated with circumcision. **Dartos Muscle**- The delicate attenuated penile dartos muscle surround the shaft of the penis

from the prepuce and is continuous with scrotal dartos muscle. It is temperature dependant and allows for the volume changes required for erection. circumcised penis shows altered response to temperature changes.

Dermis of prepuce- The dermis of the prepuce consists of connective tissue, blood vessels, nerve trunks, Meissner corpuscles within the papillae, and scattered sebaceous glands.

Outer epithelium (Skin of the prepuce) - The outer epithelium of the prepuce consists of keratinized stratified squamous cells. Melanocytes, Langerhans cells and Merkel cells are also present.

The Preputial Sac- It is colonized by Cornybacterium, Gram-negative anaerobes (especially *Bacteroides melamnogemcus*), Enterococci, Enterobacteria and coagulase-positive Staphylococci.[15]

Function of prepuce

The prepuce completely covers the glans during the years when the child is incontinent. It protects the glans from injury by contact of wet clothes or napkin. It prevents meatal ulceration.[12] The prepuce enhances sexual pleasure due to presence of nerve receptors.[15]

Treatment of Phimosis

Circumcision

Baileys and Love's Short practice of surgery book advocates Treatment of phimosis by Circumcision.[11]

Variation of opinion for indication of Circumcision -

Z Farshi in A study of clinical opinion and practice regarding circumcision shows differences on an appropriate indication for circumcision in the clinical opinions of surgeons and paediatricians. Paediatricians opinion follow generally more current evidence than those of surgeons, possibly resulting in many unnecessary circumcisions.[16]

Topical Steroid

Osrola, in his study of conservative treatment of phymosis in children instructed both the parents and the patients (when they were old enough to understand) to apply a thin layer of 0.05% betamethasone cream on the prepuce twice a day (in the morning and evening) for 4 weeks. After the fifth day of treatment, they were asked to gently retract the foreskin several times after applying the cream. They were also encouraged to retract the foreskin when they voided and during their daily bath. This shows 82% successful result, 12% partial response after 5 weeks of treatment. After second course and 6 months of follow up 90% had a retractable prepuce without recurrence of phimosis.[17]

A study of Treatment of phimosis with topical steroids and foreskin anatomy with use of 0.05% betamethasone ointment on dorsal aspect of prepuce twice daily for a minimum of 30 days and a maximum of 4 months shows successful result in 94.2% of patients irrespective of the type of foreskin anatomy.[18]

Pharmacoeconomic study shows that topical treatment of phimosis can reduce cost by 27.3% in comparison with circumcision. Therefore indicate consideration of topical treatment of phimosis prior to the decision to perform surgery.[19]

Preputial plasty

Prepuce protects the sensitive skin of the glans, provides additional lubrication and allows greater freedom of movement during sexual intercourse. Prepitual plasty is a quick and safe method of preserving prepitual function in patients needing surgical relief of a tight but unscarred foreskin. Comparative data shows post operative distress in prepitual plasty (none 45%, negligible 27.5%, moderate 27.5%, poor 0, and severe 0) while in circumcision (none 5.5%, negligible 13%, moderate 39.5%, poor 29% and severe 13%), post operative bleeding in prepitual plasty (none 37.5%, negligible 45%, moderate 17.5%, poor 0, and severe 0) while in circumcision (none 21%, negligible 45%, moderate 21%, poor 5% and severe 8%), problem passing urine in prepitual plasty (none 32.5%, negligible 30%, moderate 27.5%, poor 10% and severe 0) while in circumcision (none 45%, negligible 18.5%, moderate 23.5%, poor 8% and severe 5%). Parental assessment of discomfort during the first month using parameter that when could normal underwear be worn with comfort in prepitual plasty (< 2 days 37.5%, 2-7 days 55%, 1- 2 week 5% and > 2 week 2.5%) while in circumcision (< 2 days 5%, 2-7 days 37%, 1- 2 week 42% and > 2 week 16%). In prepitual plasty the majority could mobilize their foreskin freely without discomfort soon after surgery (2.5% within 2 days, 52% within 1 week, and 87.5% within 2 weeks). The study says compared with circumcision, prepitual plasty has few complications, and functional and cosmetic results are good, providing the prepuce is mobilized regularly after surgery.[20]

DISCUSSION AND CONCLUSION

Different Ayurvedic *Samhita* texts describes that *Niruddha prakash* is caused by vitiated *Vata dosha* where *Charma* (prepuce) is constricted and cannot be retracted to uncover the glans. This causes slow urine flow.[2,3] Treatment with *Vata dosh shamak* medicines is advised. Dilatation of prepusal meatus is done with *Niruddhaprakash nadiyantra* having opening at both the ends. *Parishek* (fomentation / pouring) of tail (oil) processed with *Vatshaman* drug of prepuce and glans is done through this *Nadiyantra*. *Parishek* is indicated for reducing pain and inflammation caused by vitiated *Vata dosha*.[21] Preputial meatus is enlarged by gradually increasing the size of *Nadiyantra* after every three days.

Researches in modern medical science shows that epidermis of deep surface of prepuce and the epidermis of glans penis are initially fused. Separation

of prepuce from glans penis may not be complete and its extent could be much variable at time of birth.[12] Complete separation of prepuce from glans penis enabling its complete retraction exposing whole of glans may normally occur up to age of 17 years.[13,14] These facts must be considered during diagnosis of phimosis.

Circumcision is considered as treatment for Phimosis. Much variation is seen in opinions of paediatricians and surgeons regarding indications of circumcision. Conservative treatment of phimosis with topical steroid using 0.05% betamithasone shows complete preputial retractability upto 90-94%.[17,18] Topical steroid treatment is cost effective as well as surgical and anaesthetic complications are bypassed. In those cases where surgical procedure becomes necessary prepitual plasty can be considered as good alternative with few complications and the prepuce can be preserved.[20]

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