MANAGEMENT OF FISTULA IN ANO IN ANCIENT INDIAN SURGERY – A CRITICAL REVIEW

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Abstract: Surgical practice was well advanced in India even around three thousand years back. Diwodas Dhanwantari and his disciple Sushruta were the pioneers of that development who encompassed their teachings and experiences in their treatise, sushruta samhita, one of the first monograph dedicated particularly for the teachings of surgical disciplines. The fundamental principles of almost every branch of surgery were encoded by Sushruta in this treatise. The science of proctology also has specific chapters attributed to it which gives a comprehensive description about the management of anorectal disorders like hemorrhoids, fissure, fistula in ano etc. Sushruta was the first to give the most systematic description about fistula in ano, called as bhagandara in Ayurveda. He gave a detailed description of bhagandara including the etiopathogenesis, clinical presentation, types, principles and techniques of management as well as the complications and the challenges in the successful management of this disease. The ksharasutra therapy, which has become the mainstay of management for fistula in ano and is one of the most successful techniques for its management in current times, was initially described by Charaka, Sushruta and Vagbhatta in their respective treatises. Present article will throw a light upon the concepts about the management of fistula in ano as described in classical texts of Ayurveda, especially sushruta samhita, which are yielding substantially good results even in the present era of technological advances.

Index Terms- Bhagandara, bhagandara pidaka, antarmukha, bahirmukha, ksharasutra.

1. INTRODUCTION
Surgical practice in India has been an integral part of Ayurveda, the roots of which can be found in three millennia old ancient scriptures. The art and practice of surgery in Ayurveda was developed by the king of Varanasi, Lord Diwodas Dhanwantari and further propagated by Sushruta, his disciple. Sushruta, who is considered as the ‘Father of Indian Surgery’ and the ‘Father of Plastic Surgery’ by some scholars, elaborated upon the teachings of Lord Diwodas Dhanwantari and encompassed the principles of surgery (known as shalya tantra in Ayurveda) in his treatise, sushruta samhita, one of the first and foremost monographs of surgery found in ancient India. In his treatise, he has described the fundamentals of almost all the branches of surgery. Laparotomy, lithotomy, reconstruction of damaged nose, lips and ears by pedicle flaps, management of burns, wounds, fractures, trauma etc. are some of his notable contributions to the field of surgery. In addition to this, he also put forth a comprehensive concept of anorectum and the anorectal disorders like haemorrhoids, fistula etc. which laid down the foundation of presently prevalent proctology practice among Ayurveda surgeons. Fistula in ano, known as bhagandara in Ayurveda, was although described in earlier compendiums of Ayurveda also, but it was Sushruta who gave the most systematic description about fistula in ano wherein he elaborated upon the etiological factors, clinical presentation, types and the principles and techniques of management of this disease as well. He categorized it as one of the most troublesome of the diseases to be cured and advised the use of medicated seton, ksharasutra, as a minimal invasive approach to treat this disease. The ksharasutra therapy for the management of fistula in ano is one of the most prevalent surgical procedures practiced by the Ayurveda surgeons in current era and has become the mainstay management for the treatment of fistula in ano. In the sections ahead, an attempt has been made to throw a light upon the concepts about the management of fistula in ano as described in classical texts of Ayurveda, especially sushruta samhita, which are yielding substantially good results even in the present era of technological advances.

2. DEFINITION & ETIOPATHOGENESIS OF BHAGANDARA
Bhagandara as the name suggests, is composed of two words; bhaga and darana. According to the shabda kalpa druma, the Sanskrit language dictionary, the word bhaga means the area between anus and genitals (i.e. perineum) and the word darana means to tear apart or to destroy [1]. Hence, the term bhagandara denotes a (sinus) disease or wound which may destroy the perianal or perineal area. According to Sushruta, bhagandara usually occur secondary to the suppuration of an abscess known as bhagandara pidaka which usually occurs in 5cm (two finger breadth) periphery around the anal region. This pidaka (abscess) may be associated with pain and fever and is usually deep rooted which, if left untreated, may burst out and result into the formation of a chronic pus discharging sinus which is communicated to the ano rectal canal at its one end [2]. The discharge may not only be the pus, but even blood, urine, gas, semen or the menstrual blood may also come out through the sinus [3] which demonstrate that the disease process may even expand to involve the urogenital organs also which are lying near the perineal region. Hence, the term bhagandara in Ayurveda may be said to comprise not only the fistula in ano but also other sinus diseases which may communicate even to the urogenital tract. The etiological factors, which may lead to the genesis of bhagandara pidaka and eventually bhagandara include faulty dietary habits, straining during defecation, prolonged sitting in uncomfortable position or at uncomfortable seats and riding over vehicles in astride position for long. All these etiological factors predispose the anal canal to some sort of trauma. In addition, the direct trauma to the anal region which may also be due to consumption of any foreign particle by mistake, like a piece of straw or fish bone has also been attributed to be the cause of this disease [4]. These traumatizing factors make the anal canal vulnerable for microbial invasion which may infect the anal glands and result into the formation of abscesses and fistulas in anal region.
3. TYPES AND SYMPTOMATOLOGY OF BHAGANDARA

In current surgical sciences, fistula in ano has been classified according to the nature and course of track in relation to the anorectal musculature (e.g. classification by Parks, Milligan-Morgan etc.) [5, 6] and according to the presence or absence of internal or external opening (blind fistulas) as well [7]. A similar approach for classification was adopted by Sushruta and Vagbhata wherein bhagandara were classified according to two approaches; one based on the external appearance, course of track and nature of discharge which is said to be due to the involvement of particular type of doshas as described in Table 1 while other based on the absence or presence of external opening, named as antarmukha and bahirmukha bhagandara [8].

<table>
<thead>
<tr>
<th>Name of Type</th>
<th>Dosha</th>
<th>Nature/ Course of Track/ Appearance</th>
<th>Features</th>
<th>Discharge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shataponaka</td>
<td>Vata</td>
<td>Fistula with multiple external openings like a water-cane or sieve</td>
<td>Different types of pain like tearing, cutting, puncturing, pricking etc.</td>
<td>Continuous thin, clear and foamy</td>
</tr>
<tr>
<td>Ushtragreeva</td>
<td>Pitta</td>
<td>Long curved track with a secondary extension like the shape of a Camel's neck (long, curved with a hump)</td>
<td>Burning pain like that of cauterization (by kshara or agni)</td>
<td>Warm and foul smelling</td>
</tr>
<tr>
<td>Parisravi</td>
<td>Kapha</td>
<td>Fistula with copious discharge (due to abscess cavity)</td>
<td>Itching, Less painful</td>
<td>Continuous and slimy</td>
</tr>
<tr>
<td>Shambukavarta</td>
<td>Vata + Pitta + Kapha</td>
<td>Fistula track which curve around the anal canal like the turns of snail’s shell or screw</td>
<td>Pricking and burning pain with itching</td>
<td>Multi-colour</td>
</tr>
<tr>
<td>Unmargi / Agantuja</td>
<td>Trauma to anorectal canal due to foreign body impaction like fish bone etc.</td>
<td>No specific course of track (non cryptoglandular in origin)</td>
<td>Gross destruction of perineal and anorectal region due to gangrene and maggotification</td>
<td>Pus, faeces, flatus, urine, semen etc.</td>
</tr>
<tr>
<td>Parikshepi</td>
<td>Vata + Pitta</td>
<td>Circular track extending all around the anal canal like that of a ‘trench around fort’</td>
<td>Burning sensation with pain</td>
<td>Pus</td>
</tr>
<tr>
<td>Riju</td>
<td>Vata + Kapha</td>
<td>Linear straight track</td>
<td>Mild pain</td>
<td>Pus</td>
</tr>
<tr>
<td>Arsho-bhagandara</td>
<td>Kapha + Pitta</td>
<td>Fistula arising from the base of arsha (i.e. sentinel tag) due to infection of fissure bed</td>
<td>Itching and burning pain</td>
<td>Continuous</td>
</tr>
</tbody>
</table>

On looking at the description about the clinical presentation of different types of bhagandara, it can be said that the classification proposed by Sushruta and Vagbhata has taken into account the course of track in both the vertical and horizontal planes unlike the classification proposed by Parks or Milligan-Morgan where they had only taken the vertical plane into consideration. Moreover, the fistulas due to foreign bodies or traumatic origin (unmargi bhagandara) and the fistulas arising due to infection in the fissure bed and presenting with an associated sentinel tag (arsho-bhagandara), which are not uncommon in clinical practice, have also been described by them. Fistulas with a long, curved (transspincteric) tracks associated with a secondary extension or abscess cavity into the ischiorectal or supralevator area were grouped under ushtragreeva bhagandara while the fistulas which are less painful and predominantly have a large abscess cavity (like fistula with an ischiorectal abscess) and present with thick, copious discharge were grouped under parisravi bhagandara by Sushruta. Other varieties have features as described in Table 1. In addition to the clinical features described above, Sushruta has also explained the prodromal features of bhagandara as itching, burning and inflammation in anal region along with presence of pain in lower back region which basically represent the features of an impending inflammation and suppuration due to anal gland infection.

4. MANAGEMENT OF BHAGANDARA

Management of bhagandara can be broadly categorized into preventive, medical, surgical and parasurgical measures which can be described as follows:

4.1 Preventive Measures

Preventive measures include the dietary and lifestyle modifications like the avoidance of heavy to digest food, avoidance of straining, uncomfortable sitting or prolonged riding etc. Apart from it, the preventive measures also aim at to manage the bhagandara pidaka which is usually considered as a prodromal manifestation of bhagandara. The local measures like application of medicaments in the form of pastes, oils, poultice etc. to localize the inflammatory process and to liquefy the pus followed by its proper drainage are the measures to deal with bhagandara pidaka which may prevent the subsequent formation of bhagandara [8].
4.2 Medical Measures

Though bhagandara is primarily a surgical disease, medical measures also hold an important role in the management of bhagandara. It is mainly advocated for localizing inflammatory process and suppuration and facilitating spontaneous drainage of pus in fistulous abscess (by application of local medicaments). Medical management has also got role in post-operative care of the patient and in wound management. Some of the classical formulations given in Ayurveda for the management of bhagandara are as follows:

**Oral formulations:** Narayan rasa, Chitravibhandaka rasa, Bhagandarahara rasa, Navakarshika guggulu, Saptavinhatika guggulu, Khadiradi kwatha [10], Vidangadi leha, Guduchyadi leha, Guggulyadi leha, Magadhikadi leha [11] etc.

**Local formulations:** Sruhyadi varti, Tiladi lepa, Nishadi lepa, Kushthadi lepa, Vishyandana tailam, Karviradya tailam, Nishadya tailam, Saindhavadya tailam, Triphala kwatha [10] etc.

4.3 Surgical Measures

The surgical measures described for the management of bhagandara may broadly be classified into general principles for all types of bhagandara and specific principles according to a particular type of bhagandara.

4.3.1 General Principles

As mentioned earlier, bhagandara is primarily a surgical disease and the treatment of choice for bhagandara has been described as chhedana or excision (i.e. fistulectomy) by Sushruta but other surgical procedures like paatana (laying open of track i.e. fistulotomy), bhedana (drainage of associated abscess), lekhana (scraping of track) and eshana (probing) are also equally important in the management of this disease.

As far as general surgical management of bhagandara is concerned, Charaka has given the sequential steps of pre-, intra- and post-operative measures in the surgical treatment of bhagandara. According to him, the patient should first be given the preoperative bowel preparation (virechana). After cleansing of bowel, the track of bhagandara should be gently probed (eshana) and after complete delineation of track, it should be laid open (paatana) which means that fistulotomy should be performed. After fistulotomy, the laid open track should be cauterized with hot oil to prevent recurrence. Or the track of bhagandara may be laid open by the application of ksharasutra. The postoperative wound should be treated with wound cleansing and healing drugs till complete healing according to the principles of wound management [12].

Sushruta has more or less told the same approach about the general surgical management of bhagandara. He has told to put the patient in lithotomy position for carrying out the procedure. The track of bhagandara then should be gently probed (antegrade or chemically (by application of agni) or chemically (by application of kshara) [8]. Thus, we can say that though Sushruta has primarily advocated for fistulectomy as the general choice of operation for bhagandara, Charaka has preferred the fistulotomy approach.

4.3.2 Specific Principles

In addition to general principles for surgical management, some specific instructions have also been given for some of the specific types of bhagandara as described below [13, 14].

**Shataponaka bhagandara:** In case of shataponaka bhagandara wherein multiple tracks or multiple branches are there, one branch or one track should be excised or laid open at one time and the other should be treated only when the previous is healed. If all the branches/ tracks are treated simultaneously, it may lead to complications like excessive tissue damage, excessive pain, more chances of infection, delayed healing and loss over sphincteric control. In addition, some specific types of incisions are also indicated depending upon the number and course of tracks as described below (Table 2). In addition, the tracks must be thermally cauterized to prevent the recurrence.

**Ushtragreeva bhagandara:** In ushtragreeva bhagandara, the track should be probed, laid open or excised and cauterized with the application of kshara. No specific type of incision is indicated.

**Parisravi bhagandara:** In parisravi bhagandara, the track should be probed, excised and cauterized by the application of kshara or agni. Here, some specific types of incision are also indicated (Table 2) for proper drainage of the associated abscess cavity.

<table>
<thead>
<tr>
<th>Type of bhagandara</th>
<th>Type of incision</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shataponaka</td>
<td>Langalaka</td>
<td>A linear incision with two side-arms, one on each side (plough or ‘L’ or ‘T’ shaped)</td>
</tr>
<tr>
<td></td>
<td>Ardhlangalaka</td>
<td>A linear incision with one side-arm (‘L’ or ‘λ’ shaped)</td>
</tr>
<tr>
<td></td>
<td>Sarvabhadralaka</td>
<td>Circular incision all around anal canal, sparing the median raphe</td>
</tr>
<tr>
<td></td>
<td>Goteerthaka</td>
<td>Semicircular incision resembling the shape of a cow’s hoof</td>
</tr>
<tr>
<td></td>
<td>Khajurapatraka</td>
<td>Branched or ‘V’ shaped incision, like the branched leaf of a date palm</td>
</tr>
<tr>
<td></td>
<td>Chandrardha</td>
<td>Semilunar incision</td>
</tr>
<tr>
<td></td>
<td>Chandrachakra</td>
<td>Circular incision</td>
</tr>
<tr>
<td></td>
<td>Suchimukha</td>
<td>Pointed, cone shaped incision with base of cone inside and tip of cone on the outside</td>
</tr>
<tr>
<td></td>
<td>Awangmukha</td>
<td>Cone shaped incision in direction opposite to suchimukha</td>
</tr>
</tbody>
</table>

**Unmargi bhagandara:** In this type of bhagandara, the impacted foreign body should be removed. The track should be excised and cauterized with heated metal probe.

**Parikshepi bhagandara:** In parikshepi type of bhagandara, the track should be excised or laid open in two-three sitings with the use of ksharasutra.
Arsho-bhagandara: In the case of arsho-bhagandara, the arsha (or sentinel tag) should be excised first and the bhagandara track should then be treated according to the measures described above; otherwise the tag may get inflamed repeatedly during the treatment of bhagandara (e.g. by ksharasutra) and may pose problems to the patient and the surgeon.

4.4 Parasurgical Measures

The parasurgical measures for the management of bhagandara include the procedures like raktamokshana, agnikarma and ksharakarma. Raktamokshana is usually done by the application of medicinal leeches (called as jalaaukavecharana) which is mainly indicated for prevention of suppuration in bhagandara pidaka and is also useful in postoperative period to minimize the inflammation and infection in wound. Agnikarma is already told to be used for cauterization of the wound bed after excision or laying open of the track to prevent the recurrence except in the case of ushtragreeva bhagandara. Ksharakarma includes either the local application of kshara or the use of ksharavarti (medicated wicks), ksharapichu (medicated gauze) or ksharasutra (medicated seton). Local application of kshara for cauterization of wound bed has already been described in above sections. Ksharavarti is used in cases wherein one end of fistulous track is closed and the varti is packed into the sinus track which gradually debride the track and make it open at both ends so that the ksharasutra may be applied for gradual laying open of the track.

The ksharasutra is a medicated thread (chemical seton) prepared by using plant based ingredients like caustic material obtained from the ashes of plants, latex of snuhi (Euphorbia neriifolia), oleoresins of guggulu (Commiphora mukul) and haridra (Curcuma longa) powder etc. The active ingredients are coated repeatedly on surgical linen (barbour) thread no. 20 so that a required amount of drug gets adhered on the thread to achieve the therapeutic value. The ksharasutra once applied in the bhagandara track with the help of a probe, is changed regularly at 7-10 days interval by rail-road technique and tied snugly on every visit. When applied judicially, it helps in cutting, curetting, draining and healing of the fistulous track. Thus, ksharasutra therapy is actually a multi-sitting fistulotomy achieved by the use of medicated thread which acts by virtue of its alkaline caustic properties. It acts as a cutting as well as draining seton. Due to the effect of drugs present in ksharasutra and mechanical pressure of tying, it gradually cuts and heals the fistulous track simultaneously. In multiple studies, it has shown a high success rate (upto 96.5%) even in cases of complex fistula in ano and now has become the mainstay of management for bhagandara in various parts of the world [15-17].

5. CONCLUSION

In conclusion, it can be said that the ancient Indian surgeons were well-versed with the types, presentation, prognosis and the complications in the management of bhagandara. Not only they had described the challenges in successful management of bhagandara, they also devised innovative measures (like ksharasutra therapy, cauterization to prevent recurrence etc.) to overcome these challenges. The surgical practices by Ayurveda surgeons in the contemporary era owe a lot to our ancient surgeons, especially in the field of proctology.

REFERENCES