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STUDY OF *CHEDANA KARMA* IN SURGICAL PRACTICE

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ABSTRACT

Chedana Karma is the foremost surgical procedure. It is needed to study and update the principles of *Chedana Karma*. *Chedana* is the foremost procedure adopted in surgical practice. All the *Brihat-trayees* have given prime importance to *Chedana Karma* and have explained it in various contexts. The term *Chedana* in Ayurvedic classical texts and the term 'excision' used in modern surgical textbooks are having same meaning. While exploring the surgical disorders explained under the indications of *Chedana Karma* and excision, many of the days are missing under the list of indications. However Sushruta while enumerating the name of the diseases and their management has given scope to the surgeons to add as well as to redesignate the disorders by using their knowledge.

Objective is to study the concept of *Chedana Karma* in detail and evaluate its role in surgical practice. 10 different surgical excisional procedures are observed regarding their clinical features and compared with the conditions explained by Sushruta. The conditions told by Sushruta are found in varying numbers but not a single disease without them.

Chedana and excision are synonymous. Features mentioned by Sushruta bear importance as they cover all the surgical diseases indicated for excision. Conditions of *Apaka, Kathinya, Sthirata* and *Kotha* explain all the possible indications for excision in any disease. The principles of *Chedana Karma* are studied thoroughly and comparison is done with the principles of excision by reviewing the literatures in Ayurveda as well as modern textbooks of surgery.

INTRODUCTION

Ayurveda is the science of life. Since time immemorial, Ayurveda has been showing the ideal way of living, which promises a disease-free, happy and long life. The Ashtanga Ayurveda is like that of ocean of knowledge consisting of many concepts in concise form. The Shalya Tantra, which deals with different surgical procedures, instruments, various types of wounds and their management with the help of *Bheshaja, Yantra, Shastra, Kshara, Agni* and *Jalauka*.[1,2,3] The philosophy, surgical ethics and concepts contributed by Sushruta, 'the father of Indian Surgery', hold good even after nearly five thousand years of development in various aspects of surgery. All the surgeries can be explained with the help of *Astavidha Shastra Karmas.* Among those *Chedana Karma* explains the procedures in which a part of the body or any growth is partially or completely dissected.[7]

Chedana is the foremost procedure adopted in surgical practice. All the *Brihat-trayees* have given prime importance to *Chedana Karma* and have explained it in various contexts. The term *Chedana* in Ayurvedic classical texts and the term 'excision' used in modern surgical textbooks are having same meaning. While exploring the surgical disorders explained under the indications of *Chedana Karma* and excision, many of the days are missing under the list of indications. However Sushruta while enumerating the name of the diseases and their management has given scope to the surgeons to add as well as to redesignate the disorders by using their knowledge.

There is description regarding *Chedana Karma* in various contexts but it is scattered in various Samhitas. So an attempt is made to collect all available knowledge and present fewer than one heading. The various principles

and views put forth by different Acharyas regarding the *Chedana Karma* needed to be understood in the context of contemporary surgical practice.

Depending upon the nature of diseases, situation in the body, improvement in the instruments used for *Chedana Karma*, it is needed to update it. Some of the commonly practiced surgeries nowadays such as appendicectomy, cholecystectomy, mastectomy etc. which include multiple surgical procedures such as *Patana, Chedana* and *Seevana Shastrakarma* explained in *Ashtavidha Shastrakarma.* In all these procedures, *Chedana* is main procedure adopted along with other *Shastra Karmas*. Here the main intention of the study is to justify the principles of *Chedana Karma* on the basis of their relevance to the modern excisional procedures.

Much technological advancement in the field of surgery such as endoscopic procedures have brought revolutionary changes by means of diagnostic accessories, improved access to deeper structures with minimal invasion. This has enabled in implementing the procedure of *Chedana Karma* with ease as well as minimal trauma to the patient.[12]

Such study regarding the details of *Chedana Karma* has not been taken up earlier. So, an attempt was made to assess the role of *Chedana Karma* in contemporary surgical practice.

The principles of *Chedana Karma* are studied thoroughly and comparison is done with the principles of excision by reviewing the literatures in Ayurveda as well as modern textbooks of surgery.

OBJECTIVE OF STUDY

All the surgeries can invariably be explained with the help of basic *Ashtavidha Shastrakarmas*. Among those, *Chedana Karma* explains the procedures in which a part of the body or any growth is dissected.

Chedana is the foremost procedure adopted in surgical practice. Sushruta, Charaka and Vaghbhata also have given prime importance to *Chedana karma* and explained it in various contexts.

While explaining *Chedya Rogas*, Sushruta has not included certain diseases in which *Chedana Karma* is performed nowadays. So it is necessary to modify the list of *Chedya Rogas.*

Depending upon the nature of diseases, size of growth, situation in the body and also advancements in supportive procedures such as anesthesia, diagnostic aids, improvements in the instruments used for the *Chedana Karma*, it is needed to update.

So a study is needed to standardize *Chedana* Karma by means of indications & contraindications. peri-operative procedures, complications, updating *Yogya Vidhi*, changes in the instruments and supportive measures and evaluate role of *Chedana* in contemporary surgical practice so that assess advancements in instruments as well as supportive measures without harming the basic principles of *Chedana Karma* can be done.

By keeping above factors in mind the study is taken up with following objectives:

- To study concept of *Chedana Karma* in detail.
- To evaluate its role in surgical practice.

METHODOLOGY

Source of data: Patients were selected in which *Chedana* is performed from Minor and Major OT.

Methods of collection of data: Patients were selected in which *Chedana* is performed from Minor and Major OT.

10 cases each of 10 different excisional procedures were taken for the study, which are regularly practiced in our hospital.

Inclusion criteria: Patients suffering from conditions in which there is *Apaka, Kathinya, Sthirata* and *Kotha* of the affected tissue and those were subjected for surgical excisions.

Exclusion criteria: Patients who have undergone surgeries for other than above conditions are excluded.

Excisional procedures observed: 10 pre diagnosed cases of 10 different diseases were selected in which *Chedana* i.e. excision was performed.

1. **Excision of appendix:** 10 selected cases were subjected for *Chedana* i.e. excision.

Procedure

- Gridiron incision was taken under spinal anaesthsia.
- Skin and sub cutaneous tissue cut
- External oblique aponeurosis was cut in the direction of fibers.
- Internal oblique split. Peritoneum opened.
- Caecum was identified and appendix was delivered out.

On examination

In 10 cases following one or more features were found.

- *Kathinya*
- *Apaka*
- *Sthirata*
- *Kotha*

Mesoappendix was clamped ligated and divided. Base of the appendix was crushed. Base of the appendix was ligated. Dissection of the appendix was done. Ilium and caecum was reposed in the abdomen and wound closed.

2. Excision of Lipoma: 10 selected cases were subjected for *Chedana* i.e. excision

On examination of the part

In 10 cases following one or more features were found.

1. Swelling measuring 2 to 4 cm
2. *Apaka*

Procedure

1. 2% xylocaine infiltrated around the lipoma.
2. Parts painted & draped.
3. Skin was cut in the direction of the crease lines.
4. Sub cutaneous tissue was cut
5. Lipoma was identified
6. Dissection was done all around.
7. Lipoma was delivered out.
8. Pedicle was ligated with 2.0 catgut

9. Haemostasis was achieved
10. Closure was done in sub cutaneous tissue with 2 –0 plain catgut.
11. Skin linen- vertical mattress

3. Excision of Thyroid: 10 selected cases were subjected for *Chedana* i.e. excision.

On examination of the part

In 10 cases following one or more features were found.

1. Swelling in the neck
2. *Apaka*
3. *Kathinya*
4. *Sthirata*

Pre operative preparation: The main aim of this pre operative treatment is to bring the patient in euthyroid state. For this Antithyroid drugs like Carbimazol & antiarrythmetic like Propranolol were given.

Operative procedure

- **Incision:** Curved incision 1 inch above extending from lateral boarder of one Sternocleidomastoid to corresponding point on other sternocleidomastoid muscle.
- Skin and superficial fascia were incised.
- Platysma divided.
- Mobilization of flaps
- Ligation of anterior Jugular vein
- Division of deep cervical fascia in the midline
- Assessment of Goiter size
- Exposure of lateral lobe legation of vascular pedicles & mobilization of lobe.
- Mobilization of opposite lobe
- Subtotal division of mobilized gland
- Repair of divided infrahyoid strape muscle

Drainage of wound & closure

4. Sebaceous cyst: 10 selected cases were subjected for *Chedana* i.e. excision

On examination of the part

In 10 cases following one or more features were found.

1. Swelling having size 2 to 5cm
2. Punctum seen
3. Adherent to skin
4. *Apaka*
5. *Sthirata*

Procedure

1. Parts painted & draped.
2. Anaesthesia-LA 2% Xylocaine infiltrated around the cyst.
3. Incision- Elliptical (to include punctum), in the direction of the skin crease lines for good cosmetic result.
4. Skin Cut
5. The sebaceous cyst was dissected all around.
6. Cyst was excised
7. Haemostasis achieved
8. Closure: suture skin with simple or vertical mattress

5. Fistulectomy: 10 selected cases were subjected for *Chedana* i.e. excision

On exposure

In 10 cases following one or more features were found.

- *Eeshatpaka*
- *Kathinya*
- *Sthirata*

Procedure

1. Fistulous track was explored with a probe
2. Probe passed without difficulty through the fistulous track into anal canal
3. A finger introduced into the bowel and probe taken out
4. Tracks were excised along with the probe in situ

6. Haemorrhoidectomy: 10 selected cases were subjected for *Chedana* i.e. excision.

On examination, in 10 cases following one or more features were found.

1. *Apaka*
2. *Sthirata*
3. *Kathinya*
4. *Kotha*

Procedure

1. At pile mass, a V- shaped cut was made through overlying mucosa at its junction with scissors. By blunt dissection with the scissor points the sub mucus space was opened up until the pile is entirely stripped from its bed.
2. A ligature of strong thread was used to transfix and tie the pedicle as high up as possible, and the distal part is cut off.
3. It was carried out for 7 O'clock pile mass also.

7. Excision of gall bladder: 10 selected cases were subjected for *Chedana* i.e. excision

Procedure

- Kocher's oblique subcostal incision: extending parallel to costal margin for about 15 cm Abdomen opened in layers.
- Place hand over liver that is retracted and manipulate in the womb.

On exposure

In 10 cases following one or more features were found

- *Apaka*
- *Sthirata*
- *Kathinya*
- *Kotha*
- Divide omental adhesions to under surface of gall bladder.
- One pack in subhepatic space to retract the intestine and another over duodenal bulb.

1. Decompression of distended gall bladder.
2. Peritoneum over neck of gall bladder incised and continues incision for short distance along its superior border. With blunt dissection space between gall bladder and liver opened and cystic artery exposed.

3. Cystic duct exposed and traced up to its junction with common hepatic duct and ligated with Vicryl 2/0.
4. Cystic artery ligated close to gall bladder wall.
5. Cystic duct was ligated divided and gall bladder was removed.
6. Drain – suction drain into sub hepatic pouch.
7. Abdomen closed in layers.

8. Excision of the breast: 10 selected cases were subjected for *Chedana* i.e. excision.

On examination: In 10 cases following one or more features were found.

- *Apaka*
- *Sthirata*
- *Kathinya*
- *Kotha*

Procedure

1. Elliptical incision to include skin overlying the tumour and the nipple.
2. Incision was prolonged upwards and laterally across the axilla to the insertion of the pectoralis major muscle.
3. Both upper and lower skin edges of the incision were undermined.
4. upper part of the incision is deepened and the skin flaps are reflected to expose the entire width of the pectoralis major.
5. All fat, lymph nodes are dissected out and pushed towards the breast.
6. The pectoral muscles are now gradually divided from the chest wall along with upper fibres of the external oblique.
7. Finally, the whole mass is removed by dividing the sternal fibres of the pectoralis major.

9. Partial amputation of penis: 10 selected cases were subjected for *Chedana* i.e. excision.

On examination: In 10 cases following one or more features were found.

- *Apaka*
- *Sthirata*
- *Kathinya*
- *Kotha*

Procedure

- A fine catheter was applied around the base of penis as tourniquet.
- Inferior flap was kept longer than superior.
- The flaps were fashioned by incising skin and subcutaneous tissue down to the Buck's fascia covering corpora cavernosa and corpus spongiosm and reflecting them back to their bases.
- The corpora cavernosa were divided at this level but corpus spongiosm and the urethra are divided 1.5-2 cm mere distally.
- The tourniquet was removed and bleeding vessels are secured.
- The end of the emerging urethra was split into two halves by short lateral incisions and each half was sutured beyond the margin of stab wound so that urethra protrudes slightly beyond the skin.
- Self retaining catheter is introduced into the bladder and removed 5 days later.

10. Above knee amputation: 10 selected cases were subjected for *Chedana* i.e. excision

On examination: In 10 cases following one or more features were found

- *Apaka*
- *Sthirata*
- *Kathinya*
- *Kotha*

Procedure

1. Application of a tourniquet.
2. Shaping of the skin flap.
3. Muscles are divided a little below the level of proposed bone section.
4. The lower end of the quadriceps muscles anterior, posterior hamstring muscles and medially the adductor gracillus and Sartorius tendon divided.
5. The periosteum is slightly elevated from the level of bone section and femur is divided through the proposed level of section. The cut end of bone is bevelled.
6. Closure of the wound.

OBSERVATIONS

Observation of *Chedya* features: The features, which have been told as indications for *Chedana Karma*, were observed for their presence in the conditions taken for the study.

Among 10 cases of appendicitis, 50 % had *Avidyamana Paka*, 20% had *Eeshatpaka*, 20% had *Kathinya* and 10 % had *Sthirata*;

Among 10 cases of cholecystitis, 30 % had *Avidyamana Paka*, 20% had *Eeshatpaka*, 20% had *Kathinya* and 30 % had *Sthirata*;

Among 10 cases of Ca breast, 40% had *Kathinya* and 50 % had *Sthirata* and 10 % had *Kotha*;

Among 10 cases of goiter 30 % had *Avidyamana Paka*, 20% had *Kathinya* and 50 % had *Sthirata*;

Among 10 cases of Carcinoma of penis, 40% had Kathinya and 40 % had *Sthirata*; 20% had *Kotha*;

Among 10 cases of fistula, 30% had *Eeshatpaka*, 30% had Kathinya,20 % had *Sthirata* and 20% had *Kotha*;

Among 10 cases of haemorrhoids, 30 % had Avidyamana *Paka*, 40% had *Eeshatpaka*, and 30 % had *Sthirata*;

Among 10 cases of lipoma, all i.e.100% had *Avidyamana Paka;*

Among 10 cases of foot gangrene, 30% had *Eeshatpaka*, 20% had *Sthirata*, and 50% had *Kotha*.

Among 10 cases of sebaceous cyst 40 % had *Avidyamana Paka*, 20% had *Eeshatpaka*, and 40 % had *Sthirata*;

Table1: Observation of *Chedya* features

Sl No	Diseases	No of cases	Features									
			Apaka				*Kathinya*		*Sthirata*		*Kotha*	
			Avidyamana Paka	%	*Eeshat Paka*	%		%		%		
1	Appendicitis	10	5	50	2	20	2	20	1	10	-	-
2	Calculus cholecystitis	10	3	30	2	20	2	20	3	30		
3	Carcinoma of breast	10	-	-	-	-	4	40	5	50	1	10
4	Goitre	10	3	30	-	-	2	20	5	50	-	-
5	Carcinoma of penis	10	-	-	-	-	4	40	4	40	2	20
6	Fistula	10	-	-	3	30	3	30	2	20	2	20
7	Haemorrhoids	10	3	30	4	40	-	-	3	30	-	-
8	Lipoma	10	10	100	-	-	-	-	-	-	-	-
9	Foot gangrene	10	-	-	3	30	-	-	2	20	5	50
10	Sebaceous cyst	10	4	40	2	20	-	-	4	40	-	-
	Total	**100**	**28**	**28**	**18**	**18**	**17**	**17**	**29**	**29**	**10**	**10**

Table 2: Types and numbers of Excisional procedures

S.No.	Name of the Procedure	2001	2002	2003	2004	2005
1	Appendicectomy	33	31	37	32	22
2	Hemorrhoidectomy	23	31	30	26	28
3	Cholecystectomy	15	12	13	15	13
4	Thyroidectomy	12	13	14	12	14
5	Mastectomy	12	14	12	15	11
6	Circumcision	17	21	13	12	21
7	Fistulectomy	18	11	10	13	16
8	Tonsillectomy	18	16	19	25	16
9	Excision of Lipoma	22	30	25	18	20
10	Excision of Sebaceous Cyst	30	33	30	30	26
11	Excisional biopsy	32	13	10	12	11
12	Lumpectomy	13	10	10	11	10
13	Amputation	20	10	14	12	12
14	Splenectomy	0	0	0	0	1
15	Ovarian cyst	2	0	1	0	0
16	Excision of Varicocele	1	0	0	1	0
17	Rectal polypectomy	12	13	11	11	08
18	Hysterectomy (Vaginal)	14	32	31	23	27
19	Abdominal Hysterectomy	35	12	38	18	23
20	Nasal polypectomy	9	23	43	43	19
21	Tubectomy	32	23	21	7	8
22	Orchidectomy	1	4	3	2	0
23	Myomectomy	0	1	0	0	0
Total		**359**	**343**	**385**	**328**	**307**

DISCUSSION

Sushruta has included *Chedana Karma* as one of the *Ashtavidha Shastra Karmas. Dalhana* while commenting on this has said that *Chedana* means complete removal of the part as in case of *Arshas*. Charaka and Vagbhata also have included *Chedana Karma* while explaining various types of *Shastra Karma.*

Chedana Karma is one of the foremost surgical procedures explained in the *Brihatrayees*.

Discussion on literary meaning: *Chedana* means cutting off, dissecting or removing.

Excision or Ectomy means surgical removal of a particular body part.

The definitions of *Chedana* and excision/ectomy draw same meaning. There is literally no difference between *Chedana* and excision. Both words can be used as synonyms for each other.

Discussion on indications of *Chedana Karma*: In *Ashtavidha Shstrakarmaadhyaya*, Sushruta has enlisted numerous diseases as *Chedya Vishayas* and stated that this should be treated by performing *Chedana Karma*.

While explaining the conditions, he has told that *Chedana karma* should be adopted in *Apaka, Kathinya, Sthirata* or *Kotha* of *Snayu Sira* etc. on the basis of above features, a comparison on the conditions and the diseases enlisted as *Chedya vishayas* can be given.

Dalhana has explained that *Apakeshu* means *Avidyamanapakeshu* or *Eshatpakeshu*. *Avidyamanapaka* means that the process of *Vranashotha* leading to *Pakavastha*, is not going on, at present. But it cannot be ruled out that this *Vranashotha* has not come before or it is not going to occur in future. *Vidyamana* means at present and *Avidyamana* means which is not present at a given time. Again further *Dalhana* has stated that *Eshatpaka* also can be subjected to *Chedana karma* as in *Valmika*. *Eshatpaka* can be taken as last stage of *Amavastha* where the inflammatory process is just started. The conditions explained by Charaka also follow the clinical entities explained by Sushruta. So there is no difference of opinion between Charaka and Sushruta.

Discussion on general precautions

Sushruta has explained the lines of incisions while doing *Shastrakarmas*. They can be followed for *Chedana Karma* also.

He has told that in *Bhroo, Ganda, Shankha, Lalata, Akshiputa, Oshtha, Dantaveshta, Kaksha, Kukshi* and *Vankshana*, the line of incision should be oblique. For extremities, the incision should be Chandra *Mandalakara*. For *Guda* and *Medhra*, it should be *Ardhachandrakriti*. If these guidelines are not followed, the incision may cause trauma to *Sira* and *Snayu*. The pain caused by incisions in a wrong direction will be intense. The wound healing is very late and there is chance of formation of *Mamsakandee*.

Similarity is found, if this principle of deciding lines of incision is compared to modern parameters of making incisions. In modern surgery, it is told in general that incisions should lie in or parallel to the 'lines of election' especially on the face. This helps in producing good scar.

Discussion on Nil by Mouth

Keeping the patient nil by mouth in surgeries of *Moodhagarbha, Udararoga, Arshas, Ashmari, Bhagandara* and *Mukharogas* was well documented in Sushruta samhita. All the conditions are related to gastro intestinal tract and abdominal organs. The idea must be to avoid complications like nausea, vomiting and contamination of the operative wound etc.

If it is compared with contemporary pre operative measures, it is strongly advised in above said conditions. Use of anaesthesia being one of the factors, where in nausea and vomiting are common complications.

Discussion on instruments

If commonly used sharp instruments compared with present day surgical practice, many of them are similar in shapes and eventually use also. The scalpel can be compared with the *Vriddhipatra Shastra*. The advantage of scalpel is that the handle comes with detachable blades facilitating sterility of the instrument as well as use. Scissors can be compared with the *Shararimukha Shastras*. Saws can be compared with the *Karapatra*.

Hence, many of the sharp instruments used for excision have similarity with the instruments explained for *Chedana Karma*. So they can be adopted for doing *Chedana Karma*.

Discussion on *Chedya Rogas*

***Bhagandara*:** Sushruta has explained that *Chedana* Karma should be adopted only after the *Bhagandara Pidika* gets *Pakwa*. *Apakwa Bhagandara Pidika* should be treated conservatively.

This statement appears to be contradictory to Sushruta's indications of *Chedana karma* where he has mentioned categorically that *Chedana Karma* should be performed only when *Apaka* is there. But from Dalhana's commentary, he has stated that *Pakwa* here means *Bhinna*. It means that the *Bhagandara Pidika* is *Pakwa*, burst open and the fistulous track is complete, having both *Paracheena* and *Avacheena Mukhas*. Then this track (in modern surgery it is called as true fistula-in-ano) should be excised by putting *Eshanee* in the track. So, if not complete and abscess is in unripened stage, then one should try to make it *Pakwa*. Then drain it completely. Only after this, the *Bhagandara* should be excised. This is explained as general treatment for all types of *Bhagandaras*.

In *Shataponaka Bhagandara*, where multiple external openings are present, one should excise main (central) track first and other tracks should be treated subsequently after the central one gets healed. The idea behind this is not to make the post operative wound too much extensive which may tear the anus leading to faecal

matter and urine coming out of this wide open post operative wound.

Further he has explained various lines of incisions which can also be considered as shapes of the post operative wound.

In *Ardhalangalaka*, incision should be taken in the shape resembling to that of anchor with one arm only i.e. 'L' shaped. In *Langalaka*, the shape should resemble to anchor with both arms i.e. 'T' shaped. In *Sarvatobhadra*, it resembles to circle. In *Goteerthaka*, the shape resembles to that of vulva of the cow.

Here comparison of *Goteerthaka* can be made with the pear shape given to the post operative wound in modern surgical procedure when a subcutaneous fistulous track is laid open and the edges are trimmed.

The other meaning of *Goteerthaka* stated in Ashtanga Sangraha like the zigzag mark made by a walking bull's urine, can be correlated to the asymmetrical shape of the wound after exploration of fistula with multiple external openings. Care should be taken that the *Sevanee* is secured from injury.

When compared it with the exploration done in contemporary surgical procedures, similarities can be observed, where the anterior midline is generally spared. In *Ushtragreeva*, there is only one track which can be excised by putting *Eshanee*.

In case of *Parisravee Bhagandara,* Sushruta has again explained different types of incisions giving shapes as follows.

In *Kharjurapatraka*, the shape resembles to palm leaf. *Chandrardha* means full moon. *Soochimukha* means pin pointed and *Avangmukha* means like an inverted cone. *Kharjurapatraka* can also be compared with the pear shape attained in the post operative wound after the fistulous track is laid open. *Avangmukha* explains the necessity to trim the edges of the wound so as to make it saucer shaped or tapering inwards.

In modern surgery also, it is advised to trim the edges so as to facilitate the granulation from the floor of the wound towards the exterior. It is even advised to trim the edges repeatedly if they overlap the wound before the granulation from the floor reaches to the surface.

The main difference with the technique of *Chedana Karma* in *Bhagandara* as told in Sushruta and the modern surgical practice is that Sushruta has told that after probing, the affected surrounding tissue should be excised out completely, keeping the probe in situ. (Fistulectomy).

According to modern surgery, the track is laid open along with trimming of the surrounding skin and fat to give it pear shape. The granulation tissue in the track is scrapped with scoop. Here the part overlying the track is excised and not along with the track itself. (Fistulotomy).

Discussion on *Chedana Karma* in *Arshas*

Dalhana has commented that *Arshas* included in *Chedya Vishayas* by Sushruta should be understood as *Vataja* & *Kaphaja Arshas*. These two are included in *Shushkarshas*. As *Chedana Karma*, if performed in *Pittaja* or *Raktaja Arshas*, chances of bleeding are manifold.

Chedana Karma should be adopted only when the *Arsha* is of big size and protruding out of the anus i.e. when it becomes *Drishya*.

Surgical excision of haemorrhoids is done similarly when the pile mass gets prolapsed through the anus i.e. third degree and fourth haemorrhoids are indicated for surgery.

Thus, there is no change in principles of *Chedana* and contemporary excision as far as the indication is concerned.

Discussion on *Chedana karma* in *Granthi*: *Granthi* should be excised only when it is not dissolved by conservative or Para surgical procedures. Excision should be done only when the *Granthi* is *Apakwa*. Similarly in modern surgery where, the diseases like cysts and lipomas which can be related to *Granthi* are invariably treated with excision being the line of treatment.

In infected cysts, the excision is delayed until the inflammatory process is over.

Discussion on *Chedana Karma* in *Kshudra Roga*

Tilakalaka, Vranavartma, Charmakeela, Mamsakanda, Adhimamsa, Mamsa Samghata, Jatumani, should be treated by excision of the mass. Detailed explanation regarding the procedure is not available.

Contemporary surgical technique can be adopted for above diseases by comparing their clinical features.

Discussion on *Arbuda*

The treatment by *Chedana* is similar to that of *Granthi*.

But while explaining the recurrence, Sushruta has told that the tumour if not excised completely and part of it is left then it will burn down the patient like fire.

When looked at the principles of modern surgery, here also it is told that the surgeon should take some part of surrounding healthy tissue to ensure that the tumour is completely removed.

Discussion on treatment of *Niruddhprakasha* by *Chedana*: Though it is not included in the *Chedya Vishayas*, Sushruta himself has told to treat it by excising the *Manicharma* (prepuce) if conservative treatment fails.

There is striking similarity when compared it with the circumcision as told in modern surgery for the treatment of Phimosis.

Discussion of *Chedana karma* in *Sira-Snayu Kotha*

Sushruta has included *Sira Snayu kotha* as one of the *Chedya Vishayas* as well as one of the four clinical conditions that are liable for *Chedana karma*.

He has not explained in detail about the clinical presentation. Dalhana commenting on *Kotha* says that it is nothing but *Pootibhava*.

While amputating the *Kothayukta Sirasnayu*, Sushruta has not explained the level of amputation as stated clearly in the modern surgery.

According to Sushruta the gangrenous part should be excised, but due to advancement in the investigative procedures as well as detection of progress of the pathology, an amputation much above the level of gangrene is done to avoid further complications.

Discussion on reference for level of amputation

In case of *Marmabhighata* to *Kshipra* and *Talahridaya*, one should amputate the limb at the level of Manibandha and *Gulphapradesha* in *Pani* and *Pada* respectively. *Kshipra Marma* is situated in between the toe (thumb) and second toe (index finger). *Talahridaya* is present at the centre of the palm or sole. But the level of amputation told is, much higher that is in the wrist and ankle region. By this we can say that it was known to Sushruta that one can do amputation much above the level of visible site of pathology to avoid further complications.

This can be accepted as a principle for *Chedana* while judging the level of amputation.

Discussion on use of artificial limb: References regarding the artificial limb can be traced back to the Vedic period which was used after amputation of the limb.

Discussion on *Chedana Karma* in *Galashundika*: Sushruta has explained the technique of *Chedana Karma* very clearly.

He has told that the excision should be optimum, more nor less.

He has explained that if more amount of tissue is excised then there will be excessive bleeding and by less, there will be *Shopha*, excessive salivation, *Bhrama* etc. complications.

He has explained same technique can be adopted in other *Mukha Rogas* like *Tundikeri, Adrusha, Koorma*, *Mamsasanghata* etc.

Tundikeri is included in Bhedya Vishayas but the general principles like *Apaka* etc., if applicable then one should not hesitate to do *Chedana Karma* in *Tundikeri*.

Discussion on the treatment of *Medovarti*: Sushruta explains that if in *Bhinna Vrana*, the *Medovarti* comes out of the wound site, it should be tied tightly with a thread and then it should be excised distally.

This is the best example, as technique used in excision of internal organs. Sushruta has beautifully explained the importance of tying a particular internal organ before excising it distally.

This same is adopted in the procedures like appendicectomy, cholecystectomy where the base of these organs is first tied with thread and then the organ is dissected distal to the ligature to avoid bleeding.

He has eve explained that to excise the *Medovarti* one should use hot instrument. So it indicates that Sushruta had a very clear-cut idea regarding the sterilization of the instruments before doing any procedure.

Also he has explained that in *Chinnavrana*, where the part of extremity is completely excised, it should be subjected to *Tailadahana*.

The idea behind this must be to induce *Sirasankocha* to stop the bleeding as *Dahana* being one of the four *Raktaskandana Upayas.*

This can be adopted in the treatment of *Kotha* where the affected part is amputated advertently, for the post operative wound management.

Discussion on *Yogya Vidhi*: In present surgical practice along with various animals as well as simulators prepared of synthetic material are being used. These can be adopted as Sushruta has explained that to acquire practical training regarding the *Shastrakarmas*, one can take similar objects.

Discussion on diseases not included in *Chedya Vishayas*: The diseases that are not enlisted in the *Chedya Vishayas* are studied because one of the treatment modalities for these diseases was excision.

The clinical features of these diseases were studied from the contemporary literature as well as in the subjects taken for the observations.

Discussion on Appendicectomy

This disease is not explained in Ayurvedic classics regarding its clinical features as well as treatment modalities.

So here the intention of taking up these diseases is to study the accountability of principles of *Chedana* Karma and verifying those principles on the contemporary indications and contraindication for excisional procedure adopted in the disease.

By studying the literature as well as cases, it is observed that not a single indication for surgical removal of appendix exceeded the conditions explained by Sushruta fit for *Chedana Karma*.

In acute appendicitis, excision is indicated as early as possible i.e. before 48hours, because the process of inflammation either advances to form a mass or it gets resolved. In both of these conditions surgery is not indicated.

Dalhana's commentary on *Apaka* condition should be taken in to consideration where he states that *Apaka* can be taken as *Eeshatpaka* where the process of inflammation has just started. *Chedana* should not be performed when the *Shopha* turns to *Pachyamanavastha*. In appendicitis this formation of mass can be attributed to late *Pachaymanavashta*.

Again it is observed that excision can be adopted after six or eight weeks called as interval appendectomy. This indication also could very well be explained by Dalhana's commentary on *Apaaka*. He has explained one more entity *Avidhyamana Pakeshu*. So by this term it can

be clearly understood that when the process of inflammation is absent.

It also indicates that the process of inflammation could have been occurred in the past and also can occur in the future. So *Chedana Karma* should be adopted in *Avidhyamana pakaavstha* i.e., when the inflammatory process is absent for the time being, this would take care of any further attacks of inflammation.

The adhesions developed restrict the movements of the already less mobile appendix. So this explains the *Sthirata*, a clinical condition indicated for *Chedana*. Here it should be taken as the adhesion of appendix mostly to the posterior wall of caecum and sometimes lower part of the ascending colon, and not the ones which are formed during masking of appendix by coils of intestine and omentum during formation of mass.

The contraindication of *Chedana Karma* in *Pakvavstha* is also justified when suppurative condition of appendix i.e. appendicular abscess is encountered. Once the *Pakvavstha* is attained it is *Bhedana Karma* and not the *Chedana* that should be adopted to treat the condition.

In modern description of the surgical intervention in case of appendicular abscess, it is clearly emphasized that surgeon should do small incision and take out as much pus as possible. Excision in this condition is not favoured it should be carried out after the clinical features are subsided. Patient should be subjected for interval appendicectomy.

Kathinya is also one condition where *Chedana* Karma is advisable.

In the present study, there were no cases of appendix found on table where the consistency was harder than normal.

But it can be revealed from the literature that in case of tumours of appendix, a harder consistency is appreciated. These tumours once found are liable for excision along with the appendix.

In case if the abdomen is opened and appendix is found to be inflamed, the tissue is expected to be very fragile and if appendicectomy is done in this stage the chances of slipping of the ligature are more. So *Kathinya* is also taken into consideration while doing *Chedana karma.*

Lastly the fourth condition i.e. *Kotha* as one of the indications for *Chedana Karma* can be found in appendix.

In case of acute obstructive appendicitis, if early appendicectomy is not done, the chances of it turning in to gangrene are great.

If gangrenous changes are doubted clinically one should not hesitate to open the abdomen.

If distal part of appendix is involved then appendicectomy will take care of the condition.

If the base of the appendix has developed gangrene then it is advised to go for right hemicolectomy.

So the disease which are not even listed in the Ayurvedic classics like appendicitis has to be treated strictly along the guidelines told in Sushruta Samhita.

There is no chance of doing excision of appendix if all of the four condition i.e., *Apaka, Sthirata, Kathinya* and *Kotha* are absent.

Cholecystectomy: Cholecystectomy is indicated for three conditions

1. Cholelithiasis producing biliary colic.
2. Acute or chronic calculus cholecystitis.
3. Ca. of gall bladder.

Like appendicectomy, here also if we go through the clinical features they don't deviate from the four conditions told by Sushruta. In case of cholelithiasis also if it is silent then cholecystectomy is done as a preventive measure, which can curb the further complications when the cholelithiasis becomes symptomatic.

Mostly silent GB stones are found accidentally on USG done to rule out any other pathology related to abdomen.

Discussion on Mastectomy

There has been no direct reference found in Ayurvedic classics regarding the mastectomy or the conditions requiring it. *Stana* has not been explained separately as a site for *Arbuda*. But as *Arbudas* occur in *Gatrapradesha* and *Stana* being an organ of periphery, presence of *Arbuda* in *Stana* can be understood though not mentioned directly.

The indications of mastectomy also do not deviate from the conditions explained by Sushruta fit for *Chedana karma*. Adequate excision is the rule to avoid recurrence as told in *Arbuda*. Ayurveda can adopt the various procedures for the mastectomy, as they do not contradict the principles of *Chedana Karma*.

Discussion on Amputation of penis in carcinoma

Excision or amputation of penile ulcer is indicated in Ayuvedic classics. Sushruta has enumerated *Upadamsha* as one of the *Chedya Vishayas*.

He has not explained about the tumours of penis.

While going through the indications and procedures adopted for carcinoma of penis, the principles of *Chedana Karma* to them can be applied.

In case *Arbuda*, along with the mass, sufficient amount of healthy tissue should be resected to ensure the non-recurrence of the growth.

Various levels of amputation are explained depending upon the involvement of tissue. This can be adopted by Ayurveda as it abides by the principles of *Chedana karma*.

Discussion on thyroidectomy: The excision is indicated in toxicity, malignancy, pressure effects and cosmetic purpose. Here also *Apaka*, *Sthirata* and *Kathinya* are present. Without them, excision of thyroid is not advisable. Here the endocrinal status of the patient is taken care of.

Discussion on amputation: The indications for amputation cover much pathology other than gangrene. The levels of amputation are decided taking the future complications in the mind.

Discussion on *Chedana karma* as a tool of diagnosis: In many cases the diagnosis of a growth is in doubt by clinical features or some laboratory investigation like fine needle aspiration cytology. In those conditions the diagnosis can be confirmed by doing excision biopsy.

In excision biopsy a small piece of the growth proper is excised and it is sent for histopathological examination where the diagnosis can be made with increasing accuracy.

Here the excision procedure compliments the technological advancement in investigations.

Thus *Chedana* can be used to decide diagnosis, prognosis of the condition and further of treatment especially malignancy.

Discussion on laparoscopy: Laparoscopic excision of the intra abdominal organs has opened a new horizon in surgical field.

It is having its own advantage and disadvantages over open surgery and constant improvement in the technology is making the laparoscopy more acceptable. This can be compared with the *Nadiyantra* explained by Sushruta having similar applications.

But here one thing should be kept in mind that it does not change the basic principle of *Chedana Karma* regarding the indications especially.

The Sushruta's conditions for indication of *Chedana karma* still hold good in spite of technological advancements and improvements in the details of excision procedures.

Discussion on observations

It is found that same features such as *Apaka, Kathinya, Sthirata* and *Kotha* are found in the diseases selected for the study. Presence of these features is variable in number but not a single case was observed without these features.

Maximum features are found in carcinoma of penis and gangrene, followed by carcinoma of breast and fistula. The malignant tumours as well as chronic diseases like fistula had more features than inflammatory diseases like appendicitis or benign tumours like lipoma.

The conditions of *Apaka* (46%) and *Sthirata* (29%) are common compared to conditions of *Kathinya* (17%) and *Kotha* (10%).

More the number of features, stronger the indication for *Chedana Karma*. Sushruta places the features in a specific order, by which the indications for *Chedana karma* become stronger from *Apaka* to *Kotha* e.g. in case of tumours of breast, if only first condition i.e., *Apaka* is present, the prognosis is relatively better. If *Kathinya* is present indicating malignancy, the prognosis is bad. If *Sthirata* is present indicating invasion, prognosis again worsens. And in case of presence of *Kotha* the prognosis of the patient is the worst.

CONCLUSION

Present study was done to evaluate the concept of the *Chedana Karma* in surgical practice. Based on the critical conceptual analysis and clinical observations, it may be concluded as follows.

- The terminologies of *Chedana*, and excision / ectomy are having similar meaning i.e. dissecting off; cutting off. So they can be considered as synonymous for each other.
- Any surgical disease having clinical features like *Apaka, Kathinya, Sthirata* and *Kotha*, is indicated for *Chedana Karma.*
- More the number of features, stronger the indication for *Chedana Karma*. Sushruta places the features in a specific order, by which the indications for *Chedana karma* become stronger from *Apaka* to *Kotha*
- The surgical diseases like appendicitis, cholecystitis etc. not included in the *Chedya Rogas*, can be considered for *Chedana Karma* by comparing their clinical features.
- Ayuveda can adopt the various procedures for these diseases, as they do not contradict the principles of *Chedana Karma*.
- The laparoscopic excision surgeries like laparoscopic appendicectomy, laparoscopic cholecystetomy etc come under Sushruta's *Nadiyantra* principles of *Chedana karma*.
- The present technique of ligation and excision comes under the concept of *Chedana* Karma for *Medovarti*.
- The design, sterilization and application of surgical instruments used for the purpose of *Chedana Karma* are still in practice.
- In *Marmabhighata* of *Kshipra* and *Talahridaya*, amputation is advised at *Manibandha* and *Gulphapradesha*, which explains about the selection of the level of amputation.

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