

Ayurvedic Inheritance of India
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Lecture - 13
Surgical Treatment Diseases

In the last lecture, we covered the medical treatment of diseases, which is only one part of the management of diseases, because as we all know, many diseases cannot be treated without surgery, and Ayurveda has a great heritage of surgery which the world recognizes today. Surgery in the public mind usually means operations. Operations are, of course, part of surgery, but surgery is much larger than operations. And, I can do no better, than quote a famous remark of John Hunter;

in fact, I used his quote to begin this course of lectures. John Hunter was a great surgeon who lived in the 18th century in England, regarded by many as the founder of scientific surgery, and he used to give a course of lectures in London for students; and in the course of one of the lectures, he made a remark and I quote, “and now, the last part of surgery, namely, operations, constitutes a reflection on the healing art. It is a tacit admission of the inadequacy of surgery; it is like an armed savage trying to get by force, but a civilized man would get by strategem”. This was the, unquote, this was a remark of John Hunter in the 18th century.

That really shows the place of operations in the whole scheme of surgery, because surgery involves diagnosis, determination of the prognosis, use of medications, the whole lot, which we have been talking about in the course of the last 10 or 11 lectures. Surgery comes in its rightful place, without which medicine cannot be complete. Now, this is really what we find in the Sushruta Samhita, because many authorities regard Sushruta as the fountainhead of surgery in Ayurveda or the Dhanvantri tradition. And Sushruta Samhita, which we have today, you will find, a great part of it deals with surgery, and there is a surgical orientation to much of what he says, but there is a lot more than operations in Samhita.

There is a lot about medicines; there is a lot about the theory of causation of disease, about medications, classification of diseases. We have referred to this in the course of these lectures. So, Sushruta Samhita is really the whole gamut of medicine with a

rightful place given for operations. Now, the, today's lecture, we will be talking mostly about the general aspects of surgery, without getting into the technique of operations and so on, or instruments; we will cover them as we go along. But the first part is Sushruta, who was Sushruta? We hear so much about Sushruta, but who was he? Where did he live? What time did he live? All these are questions of interest.

There are, unfortunately, no agreements on many of these questions, but some things are clear; everybody seems to agree that, Sushruta lived in Banaras. Banaras was a great school of surgery called Dhanvantri tradition, and a King of Kashi, Kashiraja Divodasa, or he was himself a great teacher, almost given a divine status, some even regard him as an incarnation of Dhanvantri; he was such a great physician and Sushruta Samhita begins with Kashiraja Divodasa and a group of students approaching him for instructions. That is how it begins.

Now, there, Sushruta appears; because these students go to Kashiraja and tell him, Sir, we have come here to learn medicine from you. Then he asks them, yes, you are welcome, my children; what aspect of medicine do you want to learn? They reply, we would like to learn shalya, that is surgery. And then, they also add, Sir, since we will have many questions, instead of all of us asking questions and harassing you, may we ask Sushruta, the best among us, to ask questions on our behalf. Kashiraja Divodasa accepts; he said, yes, my children, you are welcome. Sushruta is welcome to ask questions; that is how it begins.

Therefore, Sushruta belonged to that Dhanvantri school in Banaras, that much everybody is agreed; but there is no agreement on when he lived; and, instead of going, quoting various authorities, A says he lived at that time, B says something else, C says something else; these are all scholars, historians, manuscriptologists and so on, who are not necessarily surgeons, who do not necessarily look at the internal evidence in Sushruta Samhita. I think, it is worthwhile look at the internal evidence of Sushruta Samhita, about the procedures that he describes; that gives very important clues, and one of the clues, as far as I am concerned, I am very impressed, because Sushruta describes a large number of operations; but he does not describe an operation for trephining the skull.

He does not mention that at all. Now, that is a very important operation, and Sushruta not mentioning it obviously means, it was not being done at that time. If an operation was

being done, such an important procedure, it is inconceivable that Sushruta would not mention that in his book, when he mentions so many others. But later on, you find, in Buddha's time, Jivaka was Buddha's surgeon and as we saw earlier, there is extensive records, Jataka tales in legends of Buddha, etcetera, Jivaka doing this operation in Banaras on a merchant, doing a trephining of the skull, removing two worms, etcetera there; this operation is celebrated in Buddhist literature.

Now, obviously, if this was done in Buddha's time, and Sushruta does not mention it at all, the conclusion is inescapable that, Sushruta lived prior to Buddha. I think, that is a very strong evidence, which has not been given sufficient importance in all these historians' discussions on Sushruta's period; that is an important consideration. And second, Panini the great grammarian who wrote Ashtadhyay, he is believed to have lived in the 4th century, on which there is general agreement among scholars.

There are three quotations from Panini's Ashtadhyay, where he refers to Sushruta for illustrating his grammatic principles; not about surgery. He is said to have, there is a quotation, Sushruta ((FL)); so that, what was said by Sushruta is (()); that kind of quotation, giving an impression the Sushruta's name was already well known in his time; that again points to this that, Sushruta lived long before the Buddha. So, it is a very ancient tradition, and what we have today Sushruta Samhita, that is not really what Sushruta wrote. What he wrote is not available to us; what we have today is a redaction of what was written originally. The redaction was done in the 4th century AD by Nagarjuna; this much we know. So, that is an important point, the, how ancient this Indian school of surgery is, especially dating back to Sushruta.

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We will be talking about the general aspects of surgery, more like an introduction to surgery, when I deal with surgical treatment. Essentially, I will be covering the basic surgical procedures, because when you talk about a major operation, this consists of many smaller, smaller techniques. So, these techniques are used in all kinds of operations. So, they may be called units of surgery, units of operative treatment. So, I will be covering some of these basic surgical procedures. Then, the application of this basic, basic procedures in an operation, which consists of many such basic procedures.

Then, I will be saying something about the use of caustics, of cautery and bloodletting. These are not really surgical operations, but they all come within the surgeon's domain and often, in a surgical condition; these are tried, wherever possible and a surgery may come, only when these three measures fail. So, a surgeon has to be thoroughly familiar with these three techniques. So, I will be saying something about them and also the surgical options; when do you really opt for surgery? No patient comes to a doctor, physician, asking to be operated on. Everybody wants to avoid operations. So, here, how would you avoid surgical operations and when does it become inescapable. Now, that surgical options, that also, I will say something about it. So all these are general introductory topics in discussing surgery.

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DISCIPLINE OF SURGERY

- ❖ Śalyatantra (discipline of surgery) enjoyed high prestige in Suśruta's period as the first of the eight branches of Ayurveda.
- ❖ Suśruta's legendary teacher – Kāśirāja Divodāsa – proclaimed "Among the eight branches of Ayurveda, Śalya is the best and oldest and is attested by the modes of perception, inference, analogy and scriptural authority. It is the oldest because Śalya healed the wounds caused by weapons and ferocious animals in times of yore"



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Now, the discipline of surgery itself was so highly venerated; this is, salya is the, salyatantra is the Ayurvedic name for surgery. And, Ayurveda is divided into eight different branches and the first position is given for salya. Salya is the first; and even Charaka Samhita, everywhere you will find, in these eight branches which are classified, the first position is always given to salya, because of the very high prestige that this enjoyed.

The legendary teacher Kasiraja Divodasa in that initial discussion, which I referred to, he has mentioned this to his students, which is worth reading out; among the eight branches of Ayurveda, salya is the best and oldest, and is attested by the modes of perception, inference, analogy and scriptural authority. It is the oldest, because salya healed the wounds caused by weapons and ferocious animals in times of yore.

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DISCIPLINE OF SURGERY

- ❖ **“Śalya is also the most important among the branches of Ayurveda because it produces quick results from the use of instruments, alkali and cauterly and comprehends all that the other branches contain”.**
- ❖ **“It unbars the gate to heaven and is eternal, virtuous, worthy of high repute and generous in providing a means of living”.**

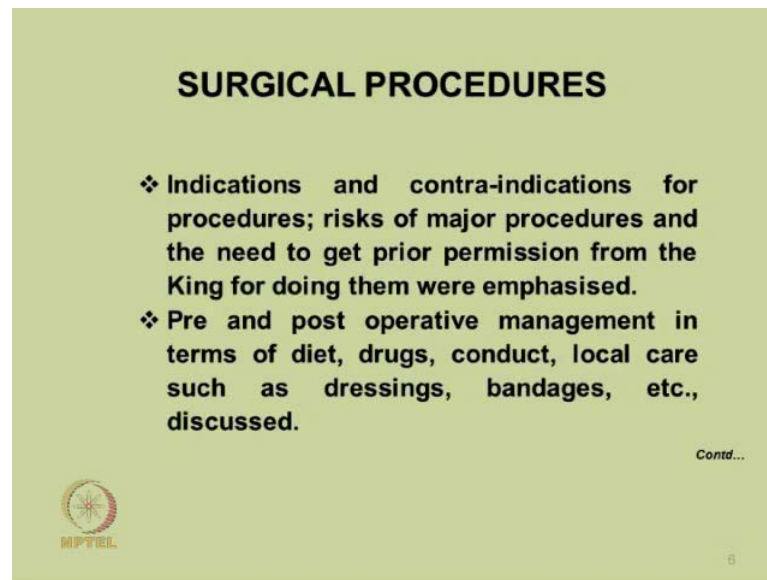


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Salya is also the most important among the branches of Ayurveda, because it produces quick results from the use of instruments, alkali and cauterly, and comprehends all that other branches contain. It unbars the gate to heaven and is eternal, virtuous, worthy of high repute and generous in providing a means of living. These are the words of Kasiraja Divodasa, who was given the status of Dhanvantri, or an incarnation of the Dhanvantri; that is a kind of very high reputation which salya enjoyed in its time.

His reference to times of yore when he talks about it, what did, he is referring to is, in Vedas, there are several descriptions of, during a war between the asuras and the devas, somebody losing a leg, and the ashwini devatas, the divine twin physicians, they are coming to fix a metallic limb; these kinds of descriptions are there. They are usually regarded as mythical, but there are references to surgery in the Vedic text. So, he is referring to that very ancient tradition; whether it was actually done nobody knows; but there is no question, but it has a very ancient tradition, even in his time.

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Then, the surgical procedures, whenever Sushruta Samhita describes, there are very detailed indications and contra-indications; this is a technical term we use in medicine. Indications for a procedure means, the occasions when you would do that, or you should do it; that is an indication. There is a need for doing that and that is an occasion to do it, that is the indication. And, there are occasions when you should not do it; if you do it in the wrong person, wrong time that can produce disastrous results. Therefore, it is a contra-indication.

So, these are technical terms used often in medicine. This indications and contra-indications for procedures, these are always listed with great detail in Sushruta Samhita. The risks of major procedures are always classified, they are given; and it is also emphasized, if you are doing a high risk operation, for example, an obstructed labor in a woman; you must remember the transportation was very poor in those days; the woman might be living in a faraway place; and the messenger comes saying, she is having labor for the last 24 hours; she is having severe pain; condition is very bad; that kind of very bad situation, where the baby maybe dead, foetus; and if the surgeon has to intervene, that is a very high risk operation.

The risk to the mother, risk to the baby, baby maybe already dead. So, this kind of very high risk to the patient, when you are going to do operation on that, then, you have to get special permission from the king, or king's officer. Now, these are very much

emphasized, wherever major high risk operations are done; how to do that, how to get this permission? So, all these details are given in the Sushruta Samhita. Similarly, before the operation, the patient has to be prepared.


You cannot, unless it is an emergency, which is also, Sushruta says that, if it is an emergency, it is like fire fighting; you cannot have any prior preparation, you have to rush and put out the fire; but other than that, all the elective operations that you do, most of the operations done are elective operations. The date is fixed, come tomorrow, day after, etcetera. During that time, a good deal of preparation is necessary, about the diet to the patient, the drugs, suppose he is a diabetic, about the drugs that he should be taking, the conduct, exercise, you should not be doing violent exercise, then come straight to the operating room; so, that conduct. Then, local care; suppose, the place where you are going to operate, there is a fracture, for example; that local care, any special cleaning required, shaving, whatever else; so, that local care, dressing, bandages, all these things are important, before operation, before you do it.

Similarly, after operation, the care of the wound, general care, how do you... Suppose, he is not able to eat after an operation. How do you feed him? He has to have nutrition. There must be some way, a special diet for him, etcetera. So, all these pre- and post-operative care, what Sushruta calls purvakarma; purvakarma is, karma is the operation; purvakarma is the preparatory steps, before that. Similarly, after the karma, paschat karma, what we call post-operative care, these are described in regard to all operations.

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SURGICAL PROCEDURES

- ❖ From the description of preparing the room for procedures by fumigation, assembly of instruments, presence of attendants, etc., it is clear that they were carried out in a residential facility.
- ❖ No mention of anesthesia. Patients were given wine to induce a state of analgesia; this was followed by strong attendants holding the patient in the desired position, and the surgeon accomplishing the procedure quickly with a highly skilled hand.



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Then, the question of the preparing the operating room; how did they do this operation? So, in those days, hospital, the term was never used; but it is very clear from the descriptions, that they had to have a residential facility to do this, a special room, a spacious room which he talks about; how that room should be prepared. Now, there you will find, there was, nothing was known about micro organisms, or infection, or anything, but they prepared the room by fumigation, assembly of all the instruments, presence of attendants etcetera.

It is clear, there was a residential facility, what we call nowadays, a hospital; and there is no mention of anesthesia. How did they do these operations without anesthesia? This is a major question and in this context, we must remember, in the western tradition also, until the 19 century, there was no anesthesia. So, the method everywhere was, including India, was to give wine in large doses, which produced the, dulls the pain sensation. It is not an anesthetic; patient is conscious, but the pain sensation is dulled; that is all it does. But still, if you use a knife and cut, it hurts. Therefore, you have to have physical restraint. These are the two methods used in Europe also, upto the 19 century. Nitrous oxide, which was a great discovery in chemistry, only with that, anesthesia came into the operating room; until then, it used to be the same as we had here; give lots of wine and control the patient. In fact, in London, if you go and see the museums of some of the great hospitals there, where operations were done in the 18th or early 19th century, like John Hunters time, there, you will see a special instrument; big knives being kept there;

these were used by surgeons, because one of the commonest operations in those days was amputation of limbs; because of infection, there was no treatment. So, they had to amputate legs, usually.

Now, to do the amputation is a very major procedure, you have to cut the bone; you have to cut the muscle, skin. Now, the method done was, to heavily give wine, big doses to the patient and the patient would be held physically and the surgeon had to be extraordinarily quick in his procedure. There was no place for a slow surgeon. So, these big knives, which you see there, which we will find difficult to use today, with that knife, he would just, within two minutes, he would cut off the leg; that was the procedure used in those days.

So, that, in India, Sushruta's time, more or less things were in that shape; there was no anesthesia. So, patients were given wine to produce analgesia, or dull pain sensation and strong attendants holding the patient in the position, desired position that the surgeon wanted; for example, an operation like removing a stone from the urinary bladder; the operation is done from the perineum; it is extremely painful; one is even wondering how this could be done; today, when you read it, you are amazed that such a procedure could be done; because it could not be done in two minutes, it takes time. So, sometimes during the procedure, the patient would die. Therefore, he had to take special permission from the king; all these are described. Therefore, without anesthesia, that was a severe limitation on the operations done in those days.

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BASIC PROCEDURES

❖ All surgical operations consist of eight basic procedures.

- Excision (chedya)
- Incision (bhedyā)
- Scraping (lekhyā)
- Puncture (vedhyā)
- Probing (eṣyā)
- Extraction (āhāryā)
- Drainage/evacuation (visrāvya)
- Suturing (sīvyā)

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Now, basic surgical procedures I mentioned. All big operations, whether it is amputation, whether it is a removing the bladder stone from the perineum, these are major operations; but they all consist of many smaller, smaller procedures, units of surgical and these are those units, which are listed here. One is the excision, you are cutting off something, chedya; that is one; and tumor or a swelling, or something; that is excision, cutting it off.

Second is incision; you make an opening. Suppose, there is an abscess, you do not have to cut it off; but you have to open, so that puss can come out; that is an incision; that is called bhedyā. Scraping; if there are warts, or small skin lesions, you want to scrape it off; that is a surgical procedure; that is lekhyā. Puncture; suppose there is a collection of blood, or puss, or something in a body chamber, you want to put a needle and puncture that. Nowadays, we do it to get a sample of that; that, that is a procedure, it is vedhyā; karna vedhyā, piercing the ear, which is done, even in India today; that was a very common, the commonest puncture was that.

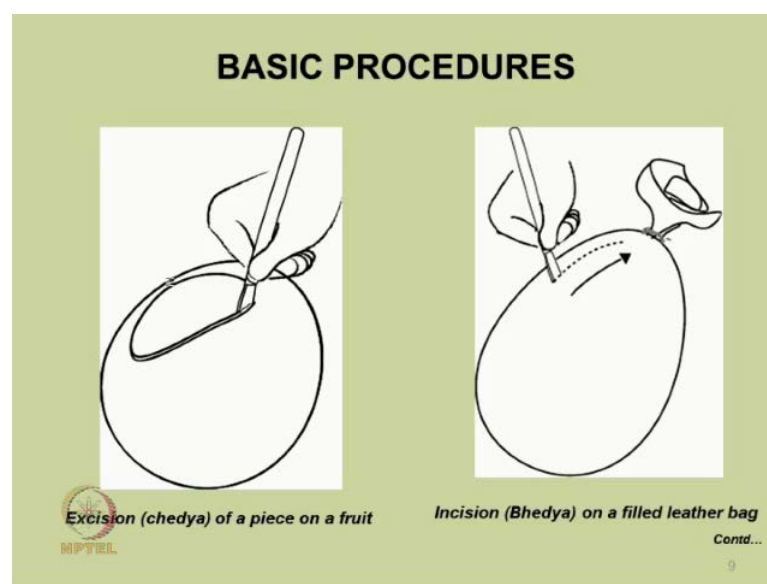
Eṣyā, probing; suppose somebody has, foreign body has got, very commonly described in Sushruta Samhita; it was very common for animals to attack somebody, or an arrow head, somebody shot an arrow and an arrow head was stuck inside and there is a track, it has gone through the skin; or somebody who has got an anal fistula, which may have a very tortuous track, if you want trace that; internal opening is one place, external is

somewhere else; and if you want to probe it, that probing, esya, that is another procedure in surgery.

Then, there is extraction. Suppose, there is a foreign body, already gone in and broken off, a splinter sitting inside. If you want to probe it, that is another, probe it and take it out; that is extraction of that foreign body, that is aharya. Then, drainage; if there is a lot of collection of blood, or puss, or anything, you want to drain it, that is visravaya; that is another procedure. Lastly, if you have a cut, or a surgical operation, you have made an incision, or animal has attacked a fresh, clean wound, you want to suture it, that is another, sivyā.

So, these are the different type of, units of surgical procedures and in one major operation, you may do many of these. It is not just one; like, for example, if you make an incision, surgical, you have to use this suturing, sivyā is necessary. So, these are different procedures, small units of procedures, which have to be combined to do a major operation. Now, these, how do you teach the trainee, when he comes; before he actually operates, he has to learn these basic techniques. And here, one of the outstanding achievements of ancient surgery in India, was using models to train young surgeons. So, what we would, it is something like one of the earliest examples of simulation used in teaching.

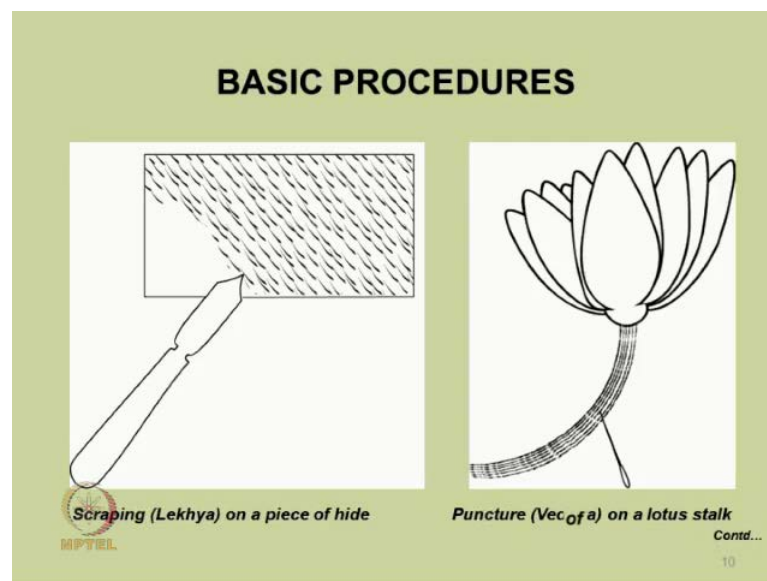
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Now, that is quite ingenious. Now, here, for example, these are all described by Sushruta. Now, here, is excision; the knife, how he should handle that knife. This is usually taught in a, in a fruit, how do you cut off a piece of that; when you make that incision, it has got internal, various contents inside that fruit attached to that, you have to cut off all those.

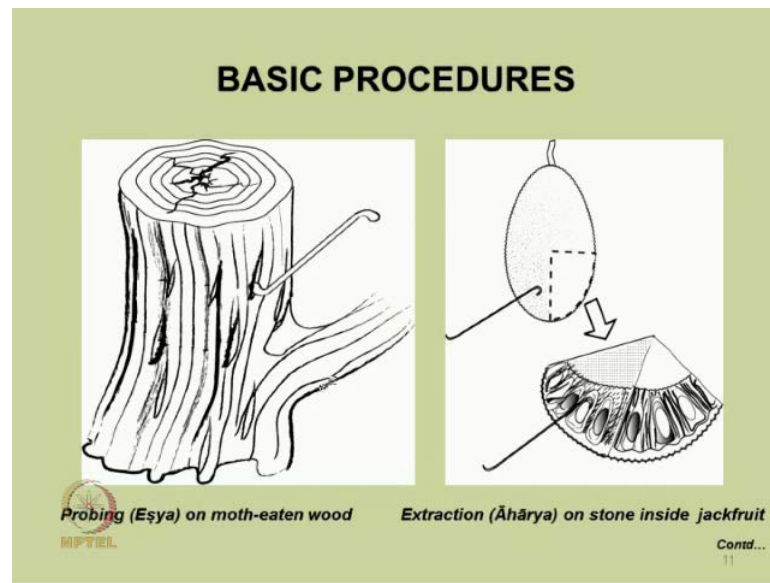
So, excising a piece of that, including the outer shell, how do you do that? How do you handle the knife? How do you handle that piece to be cut off with the forceps? All these, that excision procedure, is taught in a model like this. Similarly, another example, incision; if you want to make an incision, how do you make it, how do you let out the contents come out, that is in the...And, these are all taught in, a leather bag is used for making an incision and a fruit is used for excision.

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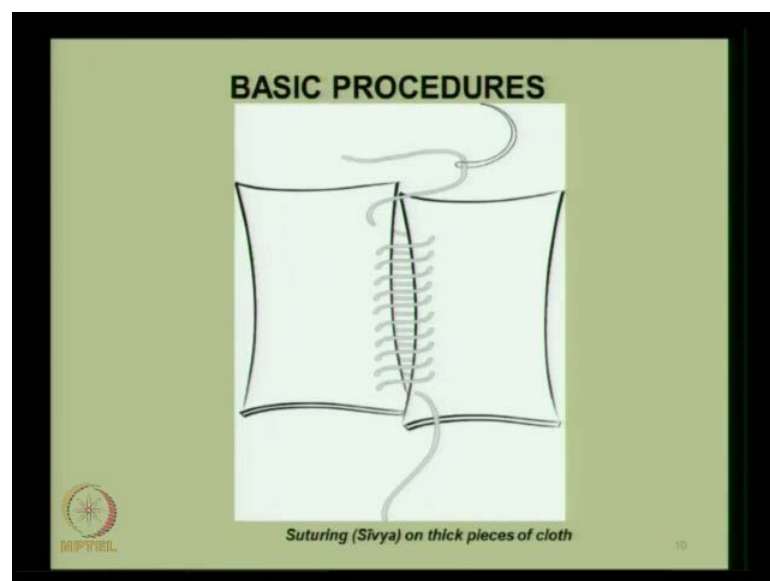
Now, then scraping; this is used on a piece of hide and the instrument also is different; you simply, on the surface only you do it; you do not go too deep, so that, you do not have blood coming out; that has to be done carefully, gently. Similarly, the puncture, vedhya, and that is in a lotus stalk, with a fine needle, how do you insert it; how do you, there are channels inside the lotus stalk, how do you look, get into that, and no further. Now, that kind of fine, precision movement, doing a puncture, that is taught in a lotus stalk.

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Then we come to probing, and here is an old moth eaten trunk of a, an old tree and here is one of the instruments called esyani, which you will see later on, in the afternoon. Now, that is used skillfully to track, how this track is going, in what direction it is going, that is taught in this model. And then, aharya is a jackfruit and a jackfruit has, inside nuts in that and how do you probe it and how do you get it out? That is again, a special instrument is used to extract it; that is taught here, another technique.

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Then, here is the two pieces of thick cloth, or hide, it is used how to stitch. There are needles, special types of needles, different types of stitching, but these are all taught in these models. So, the student, disciple undergoing training, doing this in these models repeatedly, he gets the familiarity with the instruments, how to handle them; he develops skilled hands slowly; he develops confidence; he develops speed in doing this, so that, by the time he gets to doing this on patients, or assisting his master, his teacher, he is sufficiently skilled. So, the use of models in practical training, this is more than 2000 years ago; that is something of a very great achievement, how this was done in those days.

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GETTING THE OPERATING ROOM READY

- **The following articles had to be procured and arranged in the operating room for ready use prior to the procedure.**
 - **Blunt instruments**
 - **Sharp instruments**
 - **Caustic alkali**
 - **Cautery**

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Now then, the question of getting the operating room ready. If an operation is decided, now look at the kind of preparations that they had to have; blunt instruments; we will have, the whole discussion this afternoon will be on instruments. There are two classes of instruments, a large number of blunt instruments, 100 blunt instruments were described, and there were 20 sharp instruments, yantras and shastras. Now, they all had to be in position in the operating room; caustic alkali has to be there, kshara; cautery has to be available.

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GETTING THE OPERATING ROOM READY

- Iron rod
- Surgical horn
- Leeches
- Gourd
- Jāmbavauştam (a thin rod of stone with a tip like jambū fruit).



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An iron rod should be available; surgical horn, leeches, these are used for bloodletting; gourd, again used for bloodletting; jambavaustam, it is again, something like a probe. Now, these all should be available in the operating room.

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GETTING THE OPERATING ROOM READY

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| Cotton, cloth | Muscle fat |
| Thread | Milk |
| Leaves | Oil |
| Bandage | Medicinal decoction |
| Bamboo fan | Ointment |
| Frying pan | Paste |
| Honey | Hot and cold water |
| Ghee | |

Strong and fearless attendants must be available.

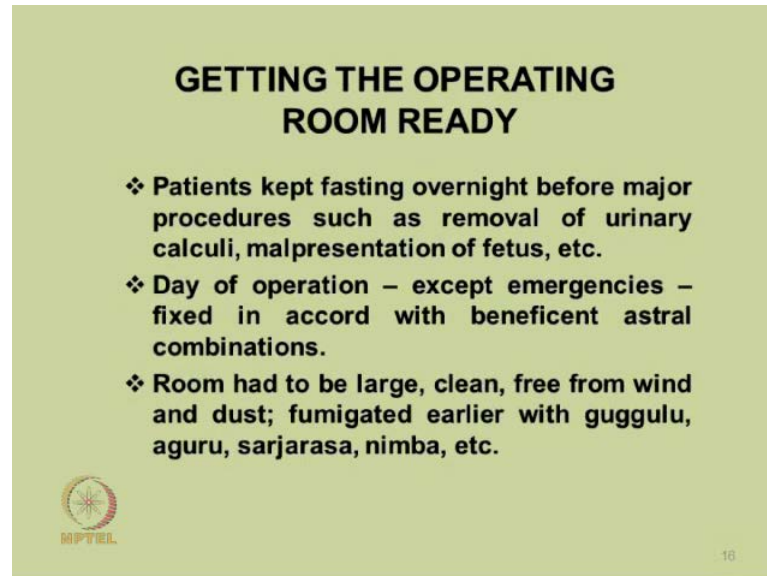


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Also, other items like these, not instruments, like cotton, cloth, thread, leaves, leaves are often used as a dressing, bandage, a bamboo fan to keep away flies and so on, a frying pan, honey, ghee, muscle fat, milk, oil, medicinal decoctions of various kinds, ointments, paste, hot and cold water, strong and fearless assistants; all these should be available in

the operating room, ready to use. And, it was the duty of the attendant to make sure that all these were available, before the procedure was started.

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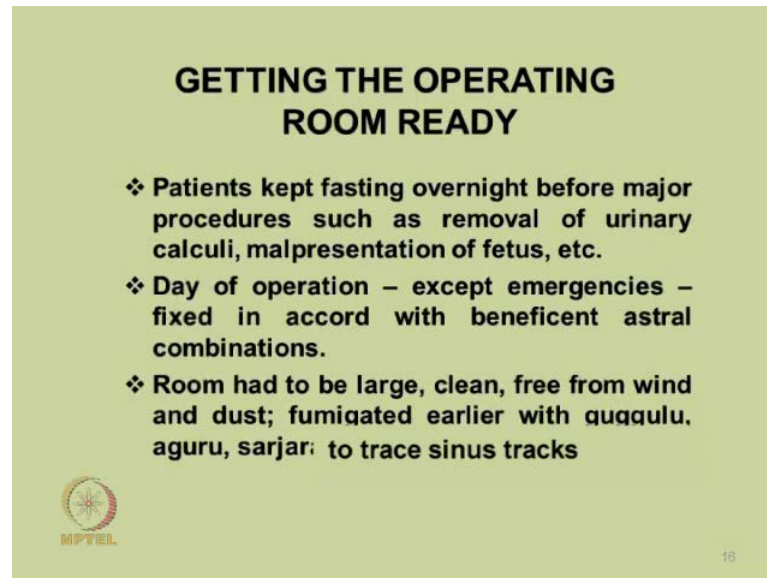
Now, the patient is kept fasting; that importance was recognized. For any major procedure, overnight fasting, that was considered necessary; like urinary calculi, malpresentation of fetus, all these are major procedures. Any such major operation to be done, patient had to be fasting overnight; that is something which we do even today. The reason being, suppose he had a meal three hours earlier, or he had been drinking something, then what happens is, not all of it would have gone away from the stomach.

So, when you are giving him lot of wine, he is kind of dazed, it is quite possible, with the first incision, he may throw up; and if he throws up, he is not fully conscious, so, it may go into his windpipe; and it may produce respiratory problems, what we call aspiration nowadays; that is a great danger, greatly feared. Therefore, a patient should be fasting overnight; that is a standard rule now, but that was observed even at that time. And, the day of the operation, the, except emergencies, where none of these can be considered, they are fixed, they always consulted the astral position, the stars, that was consulted even in those days.

All elective major operations, there was an element of danger, risk to life; so, it was believed, that an auspicious time should be fixed for operation. It is interesting that, this ancient belief in India, even today, nowadays, patients do not often say that, but once in a


while, you will see patients requesting the surgeon, Sir, I understand you have to fix it, but if possible, you please fix it on this, because of the belief in this. So, this is something ingrained in India, but at that time, it was observed.

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GETTING THE OPERATING ROOM READY


- ❖ Patients kept fasting overnight before major procedures such as removal of urinary calculi, malpresentation of fetus, etc.
- ❖ Day of operation – except emergencies – fixed in accord with beneficent astral combinations.
- ❖ Room had to be large, clean, free from wind and dust; fumigated earlier with quqqulu, aguru, sarjar: to trace sinus tracks

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And, the room had to be a large room, clean, so that, all these are, no cluttering in the room; all these are arranged which we have seen, free from wind and dust, fumigated earlier. So, this was the way antisepsis was ensured in those far off days. Nothing was known about microbes, but guggulu, aguru, sarjarous or nimba, these are all commonly used medicinal plants now, but they were used to create smoke and that fume was filled, filling this chamber for some time. That was the way the antisepsis was ensured in these operating rooms.

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| EXAMPLES OF BASIC PROCEDURES EMPLOYED IN OPERATIONS | |
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| Basic Procedures | Surgical operations |
| Excision (chedya) | Anal fistula, black mole, piles. |
| Incision (bhedyā) | Carbuncle, dental abscess, soft glandular swellings. |
| Scraping (lekhyā) | Vitiligo, ulcer tracks, scar |
| Puncture (vedhyā) | Removing fluids from abdomen; scrotum; body channels. |
| Probing (eṣyā) | to trace sinus tracks |

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Now, the basic procedures which we saw earlier, there are some surgical operations as examples, which we are giving here. Excision for example, the first one which we saw, that is used in anal fistula; a common operation in those days and anal fistula, if there is a track, that whole thing is excised. If the, it is located, its direction, its shape etcetera and once that is determined, it would be excised; cut it, cut out; black mole, piles, these are all examples, where the particular lesion, what we call a disease, the diseased part, that is excised, completely removed; that was an example of excision being used. Now, incision, carbuncle; carbuncle, it is a big abscess; especially in diabetics, very common in those days.

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| EXAMPLES OF BASIC PROCEDURES EMPLOYED IN OPERATIONS | |
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| Puncture (vedhyā) | Removing fluids from abdomen; scrotum; body channels. |
| Probing (eṣyā) | Sinus tracks to trace the cause: foreign bodies. |

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Now, there incision is used to drain the abscess. Another is dental abscess, soft glandular swellings, something like ganglion, not puss; these are soft glandular swellings. For draining all these, you would make an incision; and scraping is vitiligo, that was done. Even now, you see these white patches in the skin, ulcer tracks, superficial, scars, all these you can scrape off, so that, you reduce that disfigurement. Puncture is removing fluids from the abdomen, scrotum, body channels and so on, with a needle.

Probing as I mentioned, sinus tracks is most common, to trace the cause; to the presence of foreign bodies, etcetera you can use probes. There are very many different types of probes, curved, straight, different types of tips. So, the probes have many different kinds, sharakas, they are used to locate foreign bodies, or direction of the sinus track and so on. So, that was the use of probing.

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| EXAMPLES OF BASIC PROCEDURES EMPLOYED IN OPERATIONS | |
|--|---|
| Basic Procedures | Surgical operations |
| Extraction (Āhārya) | <ul style="list-style-type: none">• Gravel from urinary tract• Tartar of teeth• Ear wax |
| Drainage/evacuation (visrāvya) | <ul style="list-style-type: none">• Localised abscess• Inflamed ear lobe• Cystic swellings. |
| Suturing (sīvyā) | <ul style="list-style-type: none">• Repair wounds caused by incision• Repair of fresh, clean wounds. |




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Then, we have extraction, gravel from the urinary tract. Before big stones form, there is an earlier stage when smaller stones, gravel will be passing. Now, if the, there is a collection somewhere, you can use this instrument to scrape it off, so that, they do not keep on growing and becoming a big stone. Tartar of the teeth, there is a special instrument for that, how to scrape off tartar from the teeth, dantha shanku; there is an instrument to remove ear wax. So, they are all extraction from within the body. Then, the drainage, localized abscess, inflamed earlobe, cystic swellings and also the hydrocele, a very, very common condition, drainage.

Again, the same procedure is used; or fluid collection in the abdomen, or ascites, or what is called dropsy, again, this procedure of drainage evacuation, that is used. Suturing is repair of wounds caused by surgical incision, it has to be repaired. Similarly, fresh clean wounds, if it is an accident, you have to be sure that it is very clean; if there is a lot of dust or dirt in that, you will not suture it, you would leave it open; open treatment was recommended, which is even now correct, because you do not want to close it, if there is a lot of foreign material stuck there, which you cannot remove. Otherwise, repair is done, that is, suturing is used. So, these are examples of all these procedures, eight of them, that we have mentioned; all of them being used in specific operations.

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| DETAILS OF SUTURING | |
|---|---|
| ➤ The choice of needle had to be suited to the locations. | |
| Locations | Needle |
| Scanty muscle and subcutaneous tissues. | Semi circular, 2 finger breadths long |
| Muscular | Three edged, 3 finger breadth long. |
| Vital spots, scrotum, belly | Semicircular, round bodied, sharp tipped. |

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Now, suturing again, you will find, very fine details are given; different types of needles are there; semi circular needles, 2 finger breadths long. Even dimension is given. Three edged, 3 finger straight needles are given. Semi circular round body needles are given. So, different types of needles, which even now we need; we need straight needles, we need curved needles, semi curved needles. The needle will have to be kind of a three edged, so that, it is very sharp, you can pass it very quickly. There is a tough (()) if you want to, you do not want a round body needle there, you want the three edged sharp needle. So, all these different types of needles were used for scanty muscles.

Suppose, a man is wasted, he has no subcutaneous tissues. There, the approach would be different from a man with a lot of subcutaneous tissue. So, the needles used would be different. So, you can see the details are given, how to use different types of needles in different situations.

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BANDAGES

- Given great importance as they safeguard cleanliness, promote healing and support joints. A number of materials were used for making bandages. Eg.
 - Cloth made from linseed fiber, cotton, sheep's wool.
 - Silk
 - Inner layer of bark of trees
 - Animal skin.
- There were fourteen types of bandages to suit different applications. The diseased part was covered with cotton; physician holding the rolled bandage in the left hand, the bandage was applied with the right hand without folds or gaps in the desired pattern.

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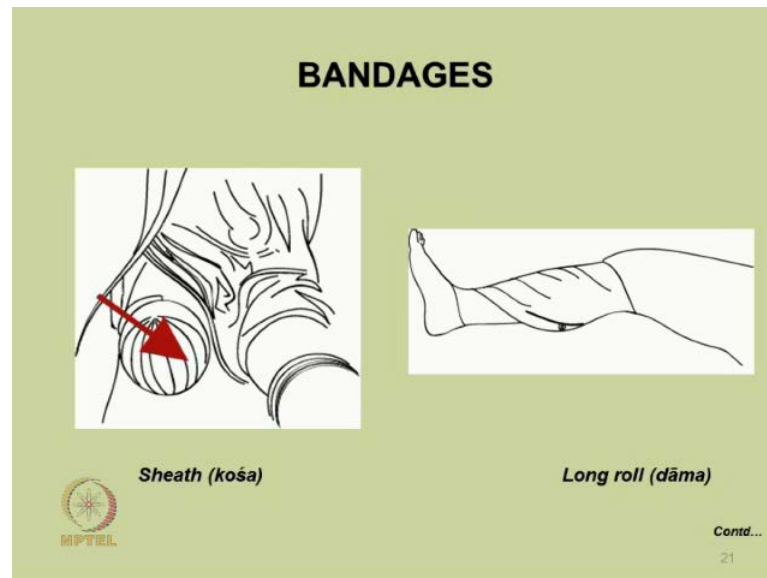
Now, then, we come to after the operation is over, you have to have bandages supplied. Now, that is a skill in itself. You have to have like, for example, an amputated limb, how do you cover it? A special type of bandage, how do you tie that? Sounds simple, but it is not very simple; it requires special skill; or, for example, suppose, there is a, surgery is done for the, old surgical operation of repairing the nose. A nose operation is done, how do you bandage that? Something on top of the skull, how do you bandage that? Something on the shoulder, or rib fracture, how do you put a bandage around that? These are special locations, special situation is there, because the rib is constantly moving, you cannot stop it. So, how do you apply a bandage?

So, that is a science in itself and there are so many, fourteen different types of bandages are described. And, you can see that, material used for this, cloth was made from linseed fiber, cotton, sheep's wool; all these were used in making a bandages, because in a very cold place, where Ayurvedic texts were written in the Himalayan country, during the winter, the bandage, you may not want to use cotton, because it has to be warm. So, you may use sheep's wool. So, different types of material were used to make these bandages; and the inner layer of bark of trees were used and animal skin were used. All these were different types of materials used in making bandages.

These are essential to keep the wound clean and to give some rest, local rest which will promote the healing and also, especially over the joints, it would support the joint.

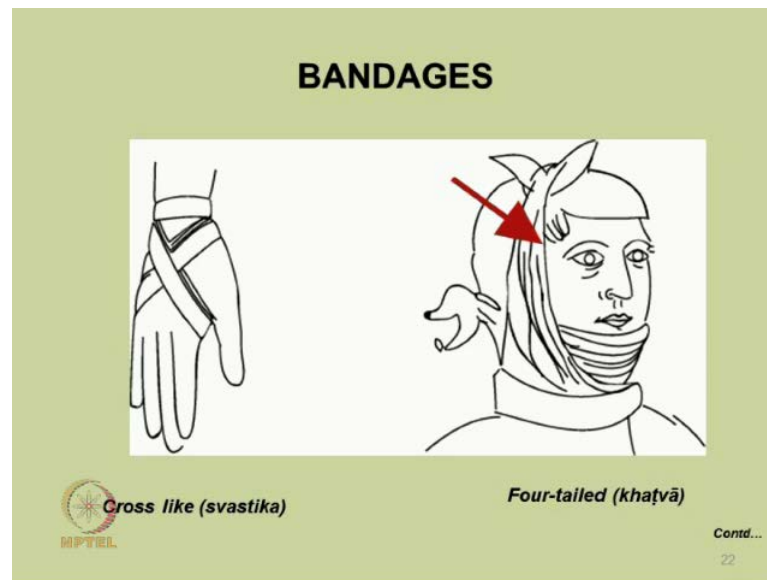
Otherwise, joints will keep on moving and delay the healing. So, therefore, multiple purposes were served by these bandages. These fourteen different types, diseased part was covered with cotton; the physician holding the rolled bandage in the left hand and he will be using that. So, something like, essentially what we are doing, that in the great detail it is given.

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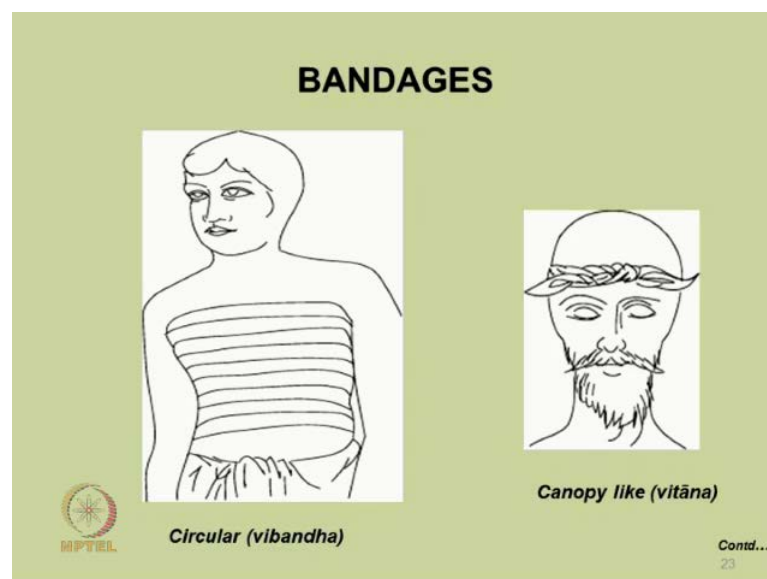
Now, these are the examples; there is a amputated limb called sheath kosa bandage; that is one type for the amputated limb. Then, if it is the middle of the leg, it is simply long roll, dama, that is another type of bandage; fairly simple to apply.

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Then, here, it is cross like. Suppose, somebody has an injury on the hand, how do you bandage that? That is a special cross like bandage applicable to the hand, and here is a khatva applied to the head and neck. These are very difficult areas to bandage. So, this is something for injuries, surgery, etcetera above the clavicle level, head and neck. There are different types of bandages. This is a khatva, a four tailed bandage applied for head and neck injuries, or say post surgery.

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Now, then, here is a circular vibandha for chest. If there is a chest injury, or a wound inflicted on the chest, and you have dealt with it; you wanted to cover it with a bandage, that is a special type of bandage. The material should be such, it will not obstruct the patient's breathing. Now, here is canopy on the top of the head. If there is surgery, or if there is a wound of some kind, and that has to be dressed. Now, here vitana, that is another type of bandage.

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Now, here is a string bandage, gosphana, which you will find often being mentioned for the nasal repair and similar procedures, which were done in those days; and there, a special type, you see how complicated that bandage is for gosphana, which is, several times I see it being mentioned, string bandage. And, five tail bandage panchangi; so there are different types of bandages for different types of locations and different types of indications.

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**DANGERS AND COMPLICATIONS IN
PERFORMING SURGICAL OPERATIONS**

Dangers:

- ✓ Too small or too large incisions.
- ✓ Surgeon injuring his hands.
- ✓ These and similar dangers are caused by the ignorance, clumsiness and inexperience of surgeons.



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Now, dangers and complications in performing surgical operations; one of the problems is incision; you make too small an incision, or too large an incision. These are very serious dangers which a surgeon should desist from. And, the surgeon injuring his hands, because there is great pressure for him to do a quick procedure, because anesthesia is not there and in that (()) he might cut himself; so that is another danger. Then, these and similar dangers are caused largely by inexperience, ignorance, clumsiness and so on, lack of proper assistance, all these could produce; but that is very dangerous for the patient.


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**DANGERS AND COMPLICATIONS IN
PERFORMING SURGICAL OPERATIONS**

Complications:

- ✓ Injuries to vital spots followed by serious or even fatal symptoms: signs suggestive of serious nerve injury.
- ✓ Signs of injuries to blood vessels, tendons, joints, bone, etc., described graphically.
- ✓ "A fraudulent physician or quack whose work is murderous and who injures himself during surgery should be avoided by all who desire to live".

Suśruta



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So, injuries to vital spots; so we had a long discussion earlier on marmas; marmas are called vital spots, recognized even from Vedic times. Now, these marmas may be, it is a confluence of different types of muscles and tendons and blood vessels. They are all joining together in a particular spot, that is a marma, which, from experience, they had seen, a damage there, can be fatal, or it can, immediate fatality, or delayed fatality, delayed complications, deformity, all these things could occur, because of this particular crucial nature of that spot, vital spot.

Now, the importance of this vital spot was precisely this. A surgeon, to locate an incision, he should be very conscious of these vital spots and to stay away from them, in sighting his incisions. So, the, because of the grave nature of injuries to the vital spot, a surgeon should avoid these vital spots in making his incision; otherwise, there will be a serious complication. Signs of injuries to blood vessels can be immediate danger, could have severe bleeding, for example; or, it could be a delayed, suppose, he has cut a nerve, or compressed it, or done some damage, you may find a few days later, that part is paralyzed, or the sensations are gone; that kind of problem.


So, all these should be avoided, by sighting the incisions properly. Then, he, Sushruta quote there, a fraudulent physician, a quack, whose work is murderous, these are his, Sushruta's, and who injures himself during surgery, should be avoided by all who desire to live. So, these are careless surgeons, or, suppose, he is not sure of the something, he does it and he knows he has made a mistake in all that confusion, and the fear that the king might punish him; that is a kind of thing which he might panic and he might hurt himself. So, all these are the lack of experience, ignorance of anatomy and so on. So, if there is a person, a surgeon like that, one should stay away from him, this is what Sushruta says.

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**OTHER PROCEDURES INCLUDED
IN SURGERY**

Caustics (Kṣāra):

- Caustic alkalis were used widely because they were lauded as doing not only the equivalent of excision, incision and scarification – but also the neutralisation of perturbed doṣas.
- Could be used topically and internally.

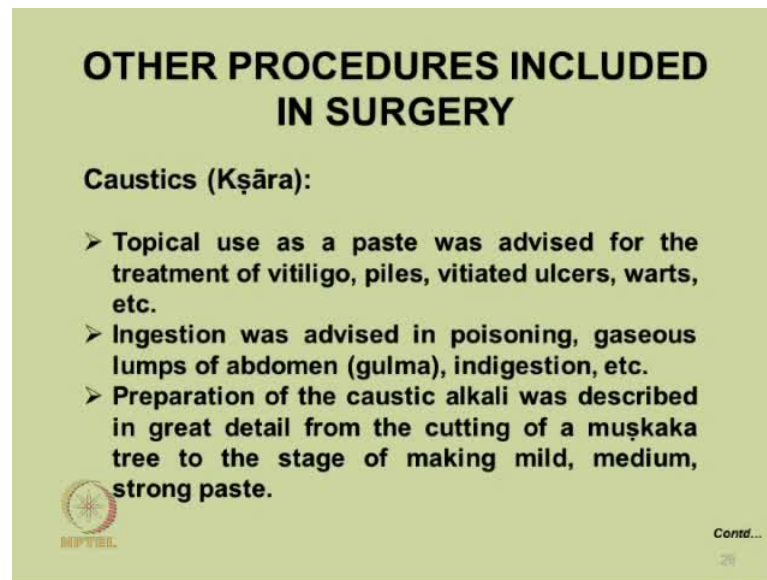


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Then, we come to the use of caustics. Many of, many conditions can be treated by the surgeon without actual operation by using caustics, ksara. That is a very important part of surgical treatment, and these caustic alkalis were very widely used and the, many of these excision, cutting off, scraping, etcetera could be avoided by using this procedure of ksara; that was the importance. It also helps, apart from cutting it off, the perturbed dosa, because after all surgical disease does not mean the whole body is not affected.

There is nothing purely local, there is a general disturbance of dosa and you might consider a surgical condition, a localized manifestation of a general disturbance of dosas. So, this ksaras also have a property of neutralizing the perturbed dosas. That is an advantage, and it can be used purely topically.


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**OTHER PROCEDURES INCLUDED
IN SURGERY**

Caustics (Kṣāra):

- Topical use as a paste was advised for the treatment of vitiligo, piles, vitiated ulcers, warts, etc.
- Ingestion was advised in poisoning, gaseous lumps of abdomen (gulma), indigestion, etc.
- Preparation of the caustic alkali was described in great detail from the cutting of a muṣkaka tree to the stage of making mild, medium, strong paste.

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Largely it is used topically, but also there are indications where you can use it internally, in treating conditions like gulma. Topical use is the most common; it is used in vitiligo, in treating piles, vitiated ulcers, warts and so on. Vitiating ulcer, from the description, it looks very much like infected chronic ulcers. In treating that again, these ksaras have a place. Ingestion, taking it orally, it was much less used, but it is used in treating poisoning, or gaseous lumps of the abdomen, indigestion and so on.


Now, the preparation of the caustic alkali, it is a long description in Sushruta, how the muskaka tree, you go to a hill, where this tree grows, at a particular auspicious moment, you have to say your prayers, how it should be cut, how it should be burnt, how it should be prepared, the whole series of steps, and finally, you have three types of ksara preparations are made, the strong, the medium, the light; all these are described in great detail, how to prepare it.

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**OTHER PROCEDURES INCLUDED
IN SURGERY**

Caustics (Kṣāra):

- A good preparation is free from excessive sharpness; is smooth, viscid, comforting and quick acting.
- The patient was prepared exactly as for a surgical procedure. The diseased area was cleaned, scraped gently and caustic applied and kept thereon for “one hundred mātras” (a mātra is the time taken to pronounce a short syllable).



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If the paste is, prepared is free from, or it has a right strength, it is medium, or mild, or strong, if that kind of paste is made, it is smooth, it is viscid, it does not flow freely; it is a viscid, a pasty kind of thing, comforting and quick acting. These are the signs of a good preparation of a ksara and the patient is prepared exactly as for a surgical procedure. Same, he has to be fasting, all those, auspicious time is chosen and the diseased area is cleaned, scraped gently and the caustic is spread and kept thereon for 100 matras. A matra is the time taken to pronounce a short syllable; that is the matra. Therefore, for a 100 matras, this is kept in contact, and then, it has to be washed off by an acidic substance like vinegar, or plain water. It is washed off, so that it does not produce a burn.

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**OTHER PROCEDURES INCLUDED
IN SURGERY**

Caustics (Kṣāra):

- This was followed by the application of sour vegetable substances and ghee to neutralise the alkaline effect of caustic.
- Indications and contra-indications were described.



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And again, the indications and contra indications when it can be used, on which type of patient it can be used, when it should not be used etcetera, all these are, a long list given, as per the guidance of the surgeon.

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**OTHER PROCEDURES INCLUDED
IN SURGERY**

Cauterisation (Agnikarma):

- Ranked above caustics.
- Successful in treating diseases resistant to drugs, or caustics.
- Opinion differs whether its use should be confined to skin and muscle only or whether it should be used to treat deeper structures such as blood vessels and joints.
- In opting for cauterisation, the main considerations are the location of disease vis-à-vis vital spots, strength of the patient, nature of the disease and the season.



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Now, other procedure, caustics, if that is not sufficient, you want to use something stronger, that is agnikarma, or use of cautery. Now, these, both the caustics as well as cautery, these were used in Buddha's time also, or even earlier. So, these are very old procedures, which you find in Sushruta Samhita, and these are ranked above caustics in

seriousness and successful in treating conditions resistant to drugs. Suppose, you have a chronic ulcer, you have tried caustics, or you have tried various medications and there is no response, and you are likely to use agnikarma and produce good results.

Now, whether if there was difference of opinion, Sushruta himself says that, for skin and subcutaneous tissue, if there are ulcers, etcetera, conditions, cauterization can be used; but it should not be used, the agnikarma for deeper lesions. Suppose, there are blood vessels, or tendons, but Sushruta's own description is, yes, it can be used. It, there is one school, where it should be used only for the skin and subcutaneous tissue; any deeper tissues involved, you should not use cautery; but that is not the view accepted by Sushruta.

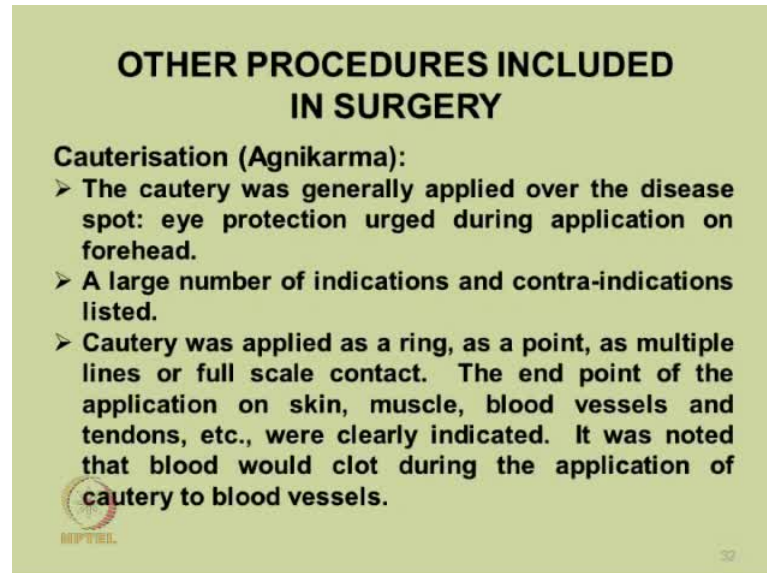
He is in favor of using it, provided, you are very sure of what you are dealing with. In that case, he is in favor of using it. He even says in one place, if the deeper lesion you are treating, suppose there is a blood vessel, when you apply cautery, the blood vessel, the blood will clot, that is what he says. So, he was fully aware of the danger; if you are cutting a blood vessel out, you will expect it to bleed; but if you are applying this in the proper manner, because of the heat, there will be a thermal coagulation, so bleeding will not take place.

In many of these, you will find Sushruta was a radical. For example, in fractures, there is a place, normally, you fracture, you set it; but suppose a patient comes to you, who had been treated elsewhere, or not treated, and he comes with deformed union; the bone has united, but there is a deformity. How do you deal with that? There, you may either say, leave him alone, that is one policy; but Sushruta says, it is possible, you should break it, and reset it. So, you will find a certain touch of radicality in his approach, like here, even in deeper lesions, you can use this agnikarma, that is what he says.

The main considerations are again, you should look at the vital spots, you should stay away, you should have a thorough knowledge of these 107 vital spots, where they are, and you should stay away from them; you should look at the strength of the patient, if you are going to apply this, for example, a deeper lesion, you want to apply a cautery, patient has to be very strong, mind and body. So, those things you must be aware, nature of the disease and the season; if the, like in the month of May, temperature is 43 degrees

in Delhi, that is not the time, when you would do this kind of procedure with no air conditioning etcetera. So, time is very important.

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**OTHER PROCEDURES INCLUDED
IN SURGERY**

Cauterisation (Agnikarma):

- The cautery was generally applied over the disease spot: eye protection urged during application on forehead.
- A large number of indications and contra-indications listed.
- Cautery was applied as a ring, as a point, as multiple lines or full scale contact. The end point of the application on skin, muscle, blood vessels and tendons, etc., were clearly indicated. It was noted that blood would clot during the application of cautery to blood vessels.

Now, the cautery was generally applied over the diseased spot. Suppose, it is on the forehead, then, the eye should be protected; if it is in the lower abdomen, the genitalia should be protected; these are all very carefully mentioned, how to protect those, when you are applying agnikarma. Now, again, you will find as usual, a large number of table virtually, of where it can be used, where it should be used, where it should not be used, contra-indications and indications; you will find the long list for all these.

The cautery which is applied, that instrument, can be of many different, depending on the kind of disease that you are treating, the localization of that disease, it may be a, shaped as a ring, or it may be a single point, or it may be multiple lines, or it may be a full scale contact, almost like a plate. So, these are, you have to be chosen the end point, the business point of that cautery, what particular shape that you want to use, that depends on the lesion that you are treating. So, that is mentioned.


Then, when you apply that, what, when should you stop? That again, the end point of application on skin, muscles, blood vessels, etcetera, they are clearly mentioned; that blood would clot during the application, the white color appears; all these, when this happens you should stop. So, those end points are very clearly described in the agnikarma.

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**OTHER PROCEDURES INCLUDED
IN SURGERY**

Blood – letting (rakta visrāvana):

- Important procedure, constituting “half of surgical practice”; importance in surgery similar to that of enemas in medical practice.
- Most beneficial in treating inflammatory diseases of recent onset; fixed and painful ulcers with irregular margins; chronic ulcers following snake bites; forbidden in generalised swelling, pallor, abdominal swelling, phthisis, piles.
- Two methods are commonly employed: scarification and venesection. Scarification involves making fine, straight scratches on the skin by a sharp instrument; venesection is drawing blood out of veins.



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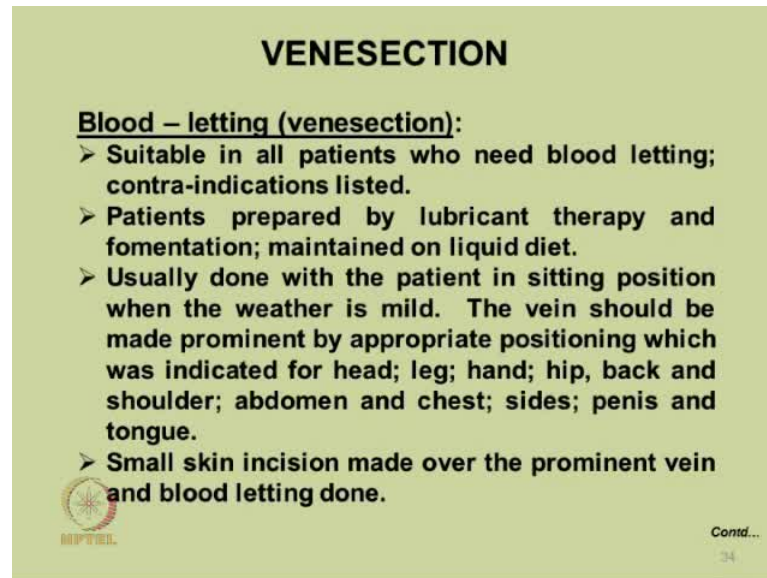
Now, then, we come to bloodletting, which is half of surgical practice, according to Sushruta. It was so extensively used for a whole variety of conditions. And, bloodletting incidentally, was a universal practice; whether it is Greek medicine, Arab medicine, everywhere bloodletting was extensively used; you often see it being mentioned. And, in the, in the medical treatment of diseases in Ayurveda, you will find the most important procedure in evacuation is enemas, use of enemas. Very large number of, Charaka for example, a whole stana is devoted to enemas. It was so very important.

Now, according to Sushruta Samhita, bloodletting has almost a similar kind of role in surgery; the number of indications for the use of bloodletting. And, in the modern medicine also, it was used, even in the early 20th century, for specific conditions. If there is a whole lot of blood collected in congestive heart failure etcetera, or a children with cyanotic heart disease, blue babies; there are conditions, where bloodletting was used even in modern medicine, even in early 20th century. So, in Ayurveda, it is most beneficial in treating inflammatory diseases of recent onset, that is one; chronic ulcers following snake bites, but it is forbidden in generalized swelling, pallor, abdominal swelling, tuberculosis, piles, etcetera.

So, these are some, I have taken from the long list of indications and contr- indications. There are two methods commonly used; one is scarification; the other is venesection. We will deal with that. And, scarification involves fine straight scratches on the skin by a

sharp instrument; whereas, venesection, you are actually drawing blood out of a vein. So, these are the two, scarification and venesection; venesection is done through different techniques.


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VENESECTION

Blood – letting (venesection):

- Suitable in all patients who need blood letting; contra-indications listed.
- Patients prepared by lubricant therapy and fomentation; maintained on liquid diet.
- Usually done with the patient in sitting position when the weather is mild. The vein should be made prominent by appropriate positioning which was indicated for head; leg; hand; hip, back and shoulder; abdomen and chest; sides; penis and tongue.
- Small skin incision made over the prominent vein and blood letting done.

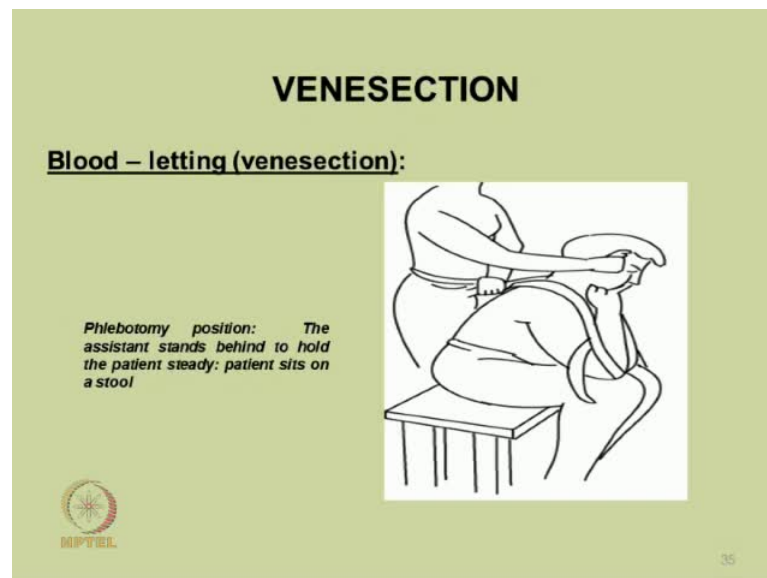
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Now, bloodletting by venesection; suitable in all patients who need bloodletting; contra-indications are listed, where it should not be done. Patients prepared by lubricant therapy and fomentation; so this, as you know, the preparatory steps used in all kinds of panchakarma; whether it is emesis, whether it is purgation, whether it is enema, all these, or nasya, any of these procedures, you have to have these preliminaries; that is, you have to have lubricant therapy, a course of a fatty substances being taken by mouth as prescribed by the physician.

Then, he has to have a whole body fomentation; that again, is another procedure and all the rationale for doing this we have discussed already; only, after that, bloodletting can be done. It is not like any, any patient, the straight out-patient, you do a bloodletting, or outpatient, you take somebody, or a tourist center, somebody coming, you give panchakarma, you give emesis; it is not just giving an emetic and making him vomit. There is a preparatory steps and these are lubricant therapy and fomentation. They are required before venesection is done, and he has to be on a nutritious diet and patient usually is in the sitting position. This is, I will give a diagram to show that.

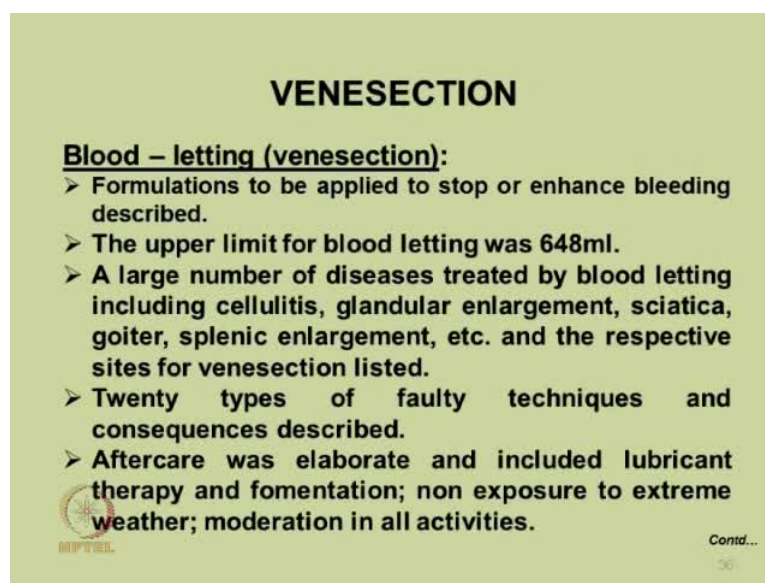
And, the vein has to be made prominent. Here, he is talking about the external jugular vein which you can see in many people; thin people you can see them. That vein is often used for head and neck venesection, head and neck conditions. Now, there, the patient is sitting up, that is a very favorite decision for bloodletting; and there, a small cut is made and the bleeding is done; and head, leg, hand, hip, hip, shoulder, abdomen, chest all these are described. If you want to do venesection for a lesion in the chest, where should you make that incision, where should you do it? All these are described; tongue, penis, every location where venesection should be done, these are described in detail. And, a small skin incision is made and that instrument to make that incision, you will see in the afternoon and then, the bloodletting is done.

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Now, this is the position in which the bloodletting is done, or phlebotomy in the neck. See, an attendant is holding him from behind, and the neck incision is made and bloodletting from the external jugular vein.

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VENESECTION

Blood – letting (venesection):

- Formulations to be applied to stop or enhance bleeding described.
- The upper limit for blood letting was 648ml.
- A large number of diseases treated by blood letting including cellulitis, glandular enlargement, sciatica, goiter, splenic enlargement, etc. and the respective sites for venesection listed.
- Twenty types of faulty techniques and consequences described.
- Aftercare was elaborate and included lubricant therapy and fomentation; non exposure to extreme weather; moderation in all activities.

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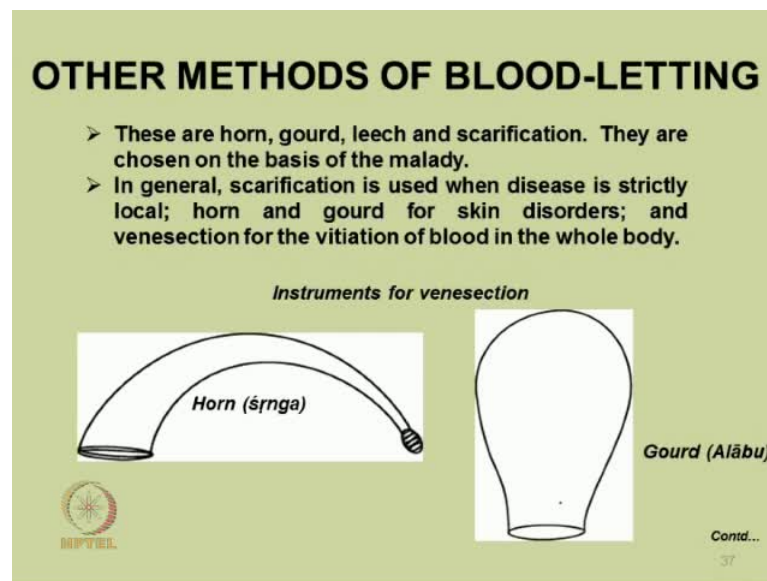
Now, formulations in this procedure, formulations to be applied to stop, or enhance the bleeding; suppose, you make the incision and blood is not coming, or it is coming too little. There you have applications and warmth applied, so that, it opens up and bleeding is enhanced; how to promote that bleeding? And suppose, the bleeding continues, and to stop it, there are various substances mentioned; you can apply and reduce or stop the bleeding, that is also mentioned. And, the upper limit for the bleeding surprisingly is 648 ml.

Now, we generally do not bleed more than 500. So, they were quite radical at that time; whether it is 648, this kind of calculation, I am not sure myself. I have asked my colleagues who are expert Ayurvedic people. They have estimated and told me it is 648. That is a bit high. Now-a-days, we do not usually take more than 500 ml or 550; so, this is, but anyway, it is more or less in that range. Large number of diseases are treated by bloodletting. They include cellulitis; I have just given common examples; glandular enlargement, sciatica, goiter; they are all completely unrelated, like sciatica or goiter, splenic enlargement.

So, these are all very diverse conditions affecting different systems. So, that, these are examples. And, the respective sides for doing venesection are also indicated for each of these. And, there are 20 types of faulty techniques, and number of different complications which can follow, including air embolism; that is also mentioned. If you

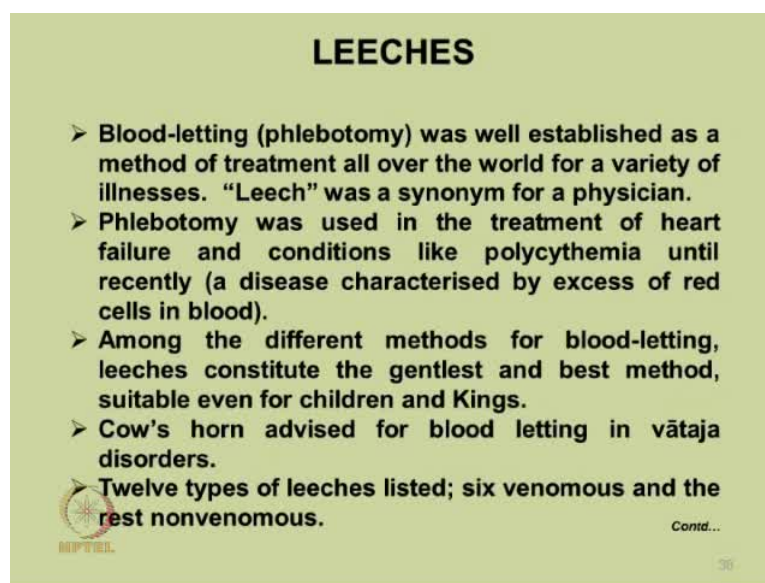
are mentioning, suppose external jugular, or veins like that, if you open it and air can get sucked in. So, air embolism is also mentioned as one of the complications. And, after this is done, the aftercare was very elaborate, including lubricant therapy and fomentation again, non exposure to extreme weather, rest, nutritious diet; so, there is a certain management almost like surgery, patients' management, following venesection.

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Now, these are, scarification is used for minor skin lesions; but something more than that, skin lesions, if you want bleeding, this is horn, a srnga is used, or it is a gourd, alabu; and when you apply this over a small incision, there is a mild suction being applied, small type of a...So scarification is used, when the disease is strictly local, it is minor. And, horn and gourd are used for skin lesions, where there is a gentle suction, a certain amount of more bleeding is promoted by the use of this. But if anything more than this is required, for whole body is affected, then, you need venesection which we have seen, or the use of leeches.

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LEECHES

- Blood-letting (phlebotomy) was well established as a method of treatment all over the world for a variety of illnesses. "Leech" was a synonym for a physician.
- Phlebotomy was used in the treatment of heart failure and conditions like polycythemia until recently (a disease characterised by excess of red cells in blood).
- Among the different methods for blood-letting, leeches constitute the gentlest and best method, suitable even for children and Kings.
- Cow's horn advised for blood letting in vātaja disorders.
- Twelve types of leeches listed; six venomous and the rest nonvenomous.

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MPTEL

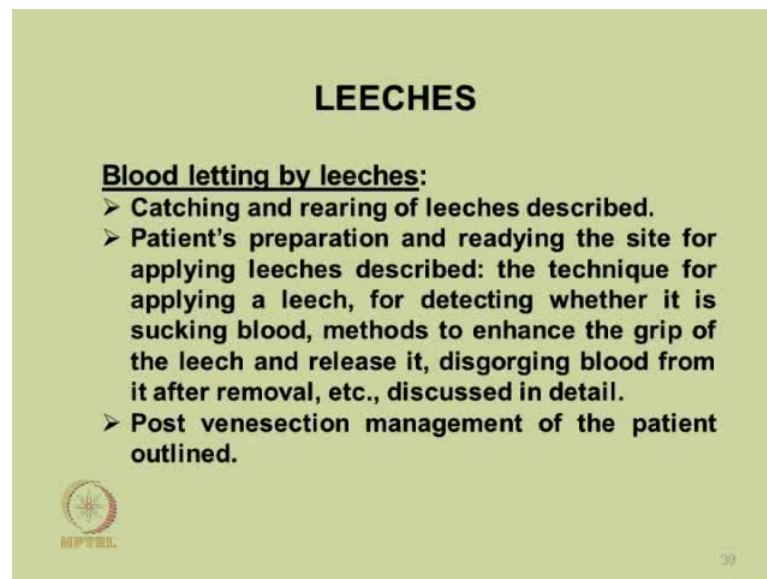
Now, leeches were highly favored because the, like, for example, children, or the king, you have to treat the king and generally, nobody would like to make an incision; so, leeches were preferred. This was the most gentle way of treating. In fact, leech was a term used for physicians; in fact, in atharvaveda, there is a hymn, famous, famous hymn which says I am a poet, my father was a leech. Now, what it means is, the leech, his father was a physician. So, leech is a synonym for physicians.

It was so commonly used and phlebotomy was used in the treatment of heart failure and conditions like polycythemia in the 20th century, which I have referred to. I have not seen it done, but I know that, in early 1920s for example, in blue babies, where their red cell contents goes up very high; that is, what happens in these children, as you know, the blood does not go into the lung; it cannot go because of a block in the heart. So they, blood does not get oxygenated. So, they are severely cyanotic.

Now, in an attempt to carry more oxygen, the body keeps on generating more and more red cells. So, they have very high; in our blood for example, the red cell percentage of blood maybe 45 percent; that is a healthy range. But if it becomes 65 percent, that is what happens in these children. So, the blood will clot; it is so high, so dense. So, there, the only attempt in those days, there was no open heart surgery to correct this. So, they would remove blood. So, that was the kind of use in 20th century.

So, it is not a discarded procedure. Leeches, this is the gentlest and the best method. And, there is a very detailed description, the type of leeches, how to collect them, all these are given. And, the cow's horn was advised, you have seen the picture of bloodletting in vataja disorders and twelve types of leeches are described, six venomous and rest non-venomous. Not all of these can be identified today, which Sushruta has described.


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LEECHES

Blood letting by leeches:

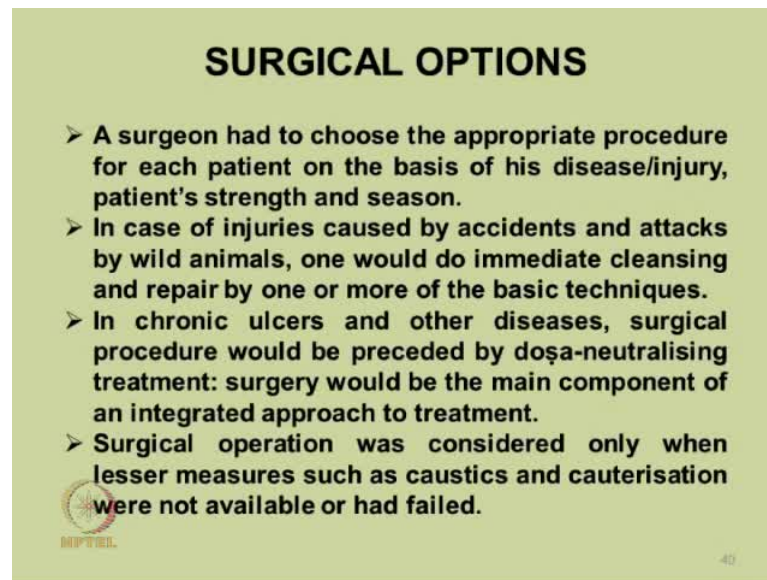
- Catching and rearing of leeches described.
- Patient's preparation and readying the site for applying leeches described: the technique for applying a leech, for detecting whether it is sucking blood, methods to enhance the grip of the leech and release it, disgorging blood from it after removal, etc., discussed in detail.
- Post venesection management of the patient outlined.

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Now, catching and rearing of leeches, where do you get them from, what does a healthy leech look like? All these are, a physician has to be aware. Readyng the site for applying the leeches, how to make it attractive for the leeches, technique of applying a leech, for detecting whether it is sucking blood, methods to enhance the grip of the leech and how to release it, when it has been full, how to release it and disgorging the blood from it after it has been removed, all these are very interesting to read that, how these techniques were used.

Obviously, the, if you read the description, it makes it very clear that, whoever wrote it had very great experience in doing this. The minutest details are given. Similarly, once the, post venesection, just like phlebotomy, there is a post operative management about local care as well as general care.

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SURGICAL OPTIONS

- A surgeon had to choose the appropriate procedure for each patient on the basis of his disease/injury, patient's strength and season.
- In case of injuries caused by accidents and attacks by wild animals, one would do immediate cleansing and repair by one or more of the basic techniques.
- In chronic ulcers and other diseases, surgical procedure would be preceded by doṣa-neutralising treatment: surgery would be the main component of an integrated approach to treatment.
- Surgical operation was considered only when lesser measures such as caustics and cauterisation were not available or had failed.

Now, surgical options. Now this is the point, I think I will stop with this. That here is important, when you see a patient, a patient or a family they come to you, not for a surgical operation. The last thing they want is operation; they want to avoid it. So, how do you make a decision, when to apply surgery? Now, here, this is the, what is meant by surgical option, a surgeon has to choose the appropriate procedure for each patient on the basis of his disease, injury, strength and season.

So, these are Sushruta's general guidelines about deciding on surgical course for a patient. And, in the case of a injury is caused by accidents or attacks by wild animals, very common in those days, one would do immediate cleansing and repair, by one of those techniques which we have seen earlier, basic techniques. But in chronic ulcers and other conditions, these are elective conditions, surgical procedure could be preceded by dosa neutralising treatment. Now, here, this is the point I made in the beginning. A surgeon is not just an operator; he is a physician with a special skill, so that, this dosa neutralizing...Suppose, he has a chronic ulcer, and he has got a generalized dosa perturbation. So, that may be the reason why that ulcer is not healing.

Now, if that is the case, a physician, a surgeon who does not know anything about dosa neutralization, that general condition underlying this local problem, then, he is unable to treat. So, this is the point which Sushruta makes. So, the, in treating that patient like that, it is the surgical intervention is one small episode in a general management of the

patient. So, he has to be fully aware of the physiology of the disease process and so on, if he wants to be successful in treating. So that dosa neutralising treatment, preparing the patient; like now-a-days, we will say that diabetic for example; a diabetic has a non healing ulcer and managing it like cauterisation and so on without knowing the underlying diabetic condition, you cannot succeed at all; you will make him worse.

Therefore, this is the point which he makes. If it is an urgent, patient who has been attacked by an animal, laceration is there, he comes to the outpatient department, you have to do something; emergency, he is bleeding, you have to do something; that is one aspect of surgery. But a great many conditions are not like that. These are chronic; they come, they have had it for several weeks, or months and they approach the surgeon. So, he has to be a good physician; that is why the Sushruta Samhita, it is not a surgical text. There is a great deal of surgery in it; there is a surgical orientation to whatever he says about drugs etcetera.

You will find that surgical orientation. There is a special section on locally applied medications, which is not there in Vagbhata or in Charaka, for the simple reason local treatment of, with medications this is important in surgery; so there is a separate section in Sushruta Samhita. So, you will find that surgical orientation throughout, but there is a great deal of authentic genuine internal medicine there; classification of drugs, which we use as an authority; because a good physician with a special surgical skill that is Sushruta's definition of a surgeon. Now, only when all the other measures, suppose surgery is necessary.

If you can treat it with caustic for example; you have a chronic ulcer, before you do excision and procedures like that, can you treat it with caustic? Or, you have piles; is it a variety which can be treated with the caustics? If it can be, then, you would try that. If that does not work, then you can try with agnikarma, a cauterisation can be used. If cauterisation will work, you would prefer to use that. These are lesser procedures. Or, can you do, in certain situations, can you treat it with bloodletting, phlebotomy? In that case, you would prefer that. So, only when all these are not applicable, or they are not likely to give good results, only then, you would opt for surgery or operation.

So, that was clearly, it does not say, even though we started in the beginning saying that salya is noblest, it is the best form of treatment etcetera, you are extolling surgery in the

beginning, but there is very clear recognition, from the patients point of view, that should be the last resort. If you can treat well with the other techniques, lesser techniques, you would prefer those; and in the absence, or not possibility of doing those, then, you would not hesitate use surgery at the right time, not to delay that.

This is the scope of this lecture, a general introduction to surgery and we will be talking about surgical instruments, because none of these procedures that we talked about, introductory, all those basic procedures, everything requires the use of instruments. Now, that is very crucial and that is a great achievement of Ayurveda in so many thousands of years ago, such a large number of instruments, very precise; we will have a detailed discussion of that.