

## TANGIBLE EVIDENCES OF SURGICAL PRACTICE IN ANCIENT INDIA

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### ABSTRACT

Practice of *Śalyatantra* (surgery) in ancient India is a proven fact beyond doubt with the aid of literary wealth, annoyingly there is very little material evidence in support of this. There are reports of some material evidences in recent times like: First anthropological evidence of brain surgery in Bronze Age Harappa; Archeological remains of surgical instruments at Taxila Museum, which include some surgical instruments: *maṇḍalāgrāśastra* (an instrument with a disc-shaped blade), *eśanī* (surgical probe), *sūcī* (needle with eyes), *saṁdamśayantra* (gripping instruments-forceps), *tālayantra* (disc with handles-spatula), few ointment applicators, tongue depressors/retractors, and some non-surgical pharmaceutical equipment which are worth taking a close look at. Among other archeological evidences, Aggalayya's Inscription is an evidence of surgical practice in 10-11<sup>th</sup> century A.D., in South India by a Jain physician. European accounts on India with respect to surgical practices point toward the following aspects: 1. The actual custodians of Indian surgery in the later period of 18<sup>th</sup> century were artisans like brick-makers, barbers; 2. The apathy of learned *Āyurvedic* physicians to take up surgery, which was completely neglected in *Āyurvedic* training by then. It created a gulf between systematized *Āyurveda* and the actual surgical practices in the field. ; It is observed that, the main reason for lack of tangible evidences of ancient Indian surgical practice is due to 'lack of medical understanding in the early explorers of Indian archeology' which has probably resulted in loss of many valuable surgical artifacts, due to ignorance, which in all probability are preserved in minor metallic collections. It is high time now to take a closer look at minor archeological collections in our national museums, individual collection in addition to the paleo-anthropological studies to reclaim the tangible evidences of ancient India surgical practices.

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‘Indian surgery remained ahead of European until the 18th century, when the surgeons of the East India Company were not ashamed to learn the art of rhinoplasty from the Indians’.

- A.L.BASHAM (The wonder that was India, 1967)<sup>1</sup>

Surgery is an inevitable part of health care. In war of peace, the human race cannot do away with it. A.L. Basham, the patron of Indian history, culture has rightly noted that, ancient India is credited with the fact that, it is one of the civilizations which has evolved empirical surgery.<sup>2</sup> The caesarian section was known, bone-setting reached a high degree of skill, and plastic surgery was developed far beyond anything known elsewhere at the time. Ancient Indian surgeons were skilled to reconstruct noses, ears and lips, lost or injured in battle or by judicial mutilation.<sup>3</sup> The statements made by Basham here bring in a feeling of pride and sense of defeat simultaneously. The primary reason for such a rise and fall in the fallacious understanding of *Āyurvedic* (Indian medicine) surgery and its history is due to lack of material, tangible evidences.

Primary sources are first-hand accounts of an event or time in history that has yet to be interpreted by another person.<sup>4</sup> In case of *Āyurveda* the Classical texts of the bygone times, though very authentic in content, will only serve the purpose of primary sources partially as they are re-structured and technical in nature. For researchers who are attempting to chronicle the history of *Āyurveda*, especially surgery the primary evidences in the form of artifacts such as objects, tools, clothing, archeological artifacts, anthropological analysis, come very handy as tangible evidences.

Most of Indian Medical history pertaining to *Āyurveda* and *Śalyatantra* (surgery) are based on the vast amount of literary works, including the Vedas. Unless these descriptions are corroborated with primary evidences, it is very difficult to accept the historicity of their practice. At this juncture it is very important to seek answers for questions like: what were reasons for decreasing patronage to Śalya (Surgery) from learned *Āyurvedic* tutors.; Who were the actual custodians of Indian surgery, who continued to render surgical services to the needy up to 18<sup>th</sup> century and in the later period till date; is the hypothesis put-forth which assumes that the Jain, Buddhist ahimsa principles were responsible for decline in taking up surgical practices is correct; Does the ancient surgical practice at any point of time was under Greek influence; In what way the surgical Indian ideas supported to the development of reconstructive surgery; and finally how to decipher the descriptions provided in famous surgical treatises of *Āyurveda* like *Suśrutasaṃhitā*, so that they can be adopted for practice today; The very objective of this paper is to collate and present as many

primary, tangible evidences as possible reported till date, to establish the certainty of *Āyurvedic* surgical practices and seek answers to these questions.

**Dearth of tangible evidences of surgical practice in Ancient India.**

a. *Lack of interest among historians to consider medical/surgical practices as important part of recoding history.*

Practice of surgery in India continued in its rudimentary forms, as a family profession catering the needs of villages, urban elite in India, which somehow was not a subject of interest to the historians and anthropologists. This was probably due to blind faith that, the surgery attempted by peasants, family practitioners though lacking in sophistication does not need any special attention, as was the case with innumerable Indian inventions, craftsmanship in other areas such as engineering, textiles, metallurgy etc., Most of the post independence works carried out with respect to Indigenous health care methods of India, concentrated upon recording the house hold remedies, ethno-botanical explorations, food practices etc., but very little has been attempted to record, surgical skills. Kanjiv Locan (2003) in his essay '*Historiography of Early India Medicine*' written as an appendix to his book titled '*Medicines of early India*' observes that the standard of *Āyurvedic* historiography is very poor 'partly due to the dearth of sources which permit reconstruction of different stages of the evolution of the system of medicine.'<sup>5</sup> It is observed that despite having a huge corpus of literature *Āyurvedic* historiography lacked behind and got compartmentalized due to the faulty approach adapted i.e., not seriously attempting to view the history of *Āyurveda* with social, historical, behavioral approach.<sup>6</sup>

b. *Lack of corroborating Archeological evidence to Surgical Practice.*

Nasim H. Naqvi observes that 'It is interesting to note the dichotomy of having substantial historical evidence to support the prevalence of medical and surgical practices during ancient times in the Indian subcontinent. But striking lack of report<sup>7</sup> of any archeological remains viz., surgical equipment, pharmaceutical instruments etc., from the sites of excavation of ancient sites like Mohenjo-Daro, Harappa. Takṣaśīla (Taxila) etc.,' is a real matter of concern. The reasons for this as postulated by Nasim H. Naqvi:'the archeologists of older school were more interested and found it exciting when huge stone sculptures, jewelry or coins were discovered while smaller pieces were always lumped under the heading of minor objects and not taken as seriously as big beautiful sculptures.'<sup>8</sup>

He continues to report that 'from Kabul to Taxila wherever methodical archeological excavations have been carried out, among the minor artifacts occasionally a medical item or even a proper surgical instrument has been identified.'<sup>9</sup> It is also observed that, giving

importance to minor objects began only with the later day modern archeologists, due to their open mindedness, who allowed the establishment of medical archeology as a special branch during later periods which helped to separate medical artifacts from the rest.<sup>10</sup>

*c. Decline of importance to Surgery as a subject of serious academia in India:*

A testimony to this argument is provided by Fra Paolonos observations on exclusion of surgery as teaching subject by 18<sup>th</sup> century<sup>a</sup> Indigenous schools. It is noted that by the end of 18<sup>th</sup> century surgery, anatomy, and geography were excluded from the list of subjects regularly taught in indigenous schools. Fra Paolino observed that the Indians were of opinion, that their country was the most beautiful and happiest in the whole world: and for that reason they have very little desire to be acquainted with foreign kingdoms. Their total abstinence from all flesh, and the express prohibition of their religion which forbids them to kill animals, prevent them from dissecting them and examining their internal construction.<sup>11</sup>

The scenario which continued for over a millennia from medieval period has resulted in repetitive copying of basic surgical information from some select texts like *Suśrutasaṃhitā*, without improving up on by the later texts viz., *Aṣṭāṅgahṛdaya*, *Aṣṭāṅgasāṅgraha* which just served the purpose of an album but failed to transfer the technique to actual practitioners of surgery, who generally hail from artisan families like barbers, brick-makers<sup>12</sup> who had no access to sanskritized medical texts and training.

Unfortunately to this date, this aversion continues in *Āyurvedic* scholars who merely restrict their area of interest to theoretical surgery. Even today nothing much from such classical surgical descriptions is incorporated in day to day surgical practice of even *Āyurvedic* medical institutions, and if at all attempted at some places is very much under reported in the peer reviewed journals.

**Solutions to overcome the lacunae:**

There is a need to re-look at the information provided in *Āyurveda* with respect to surgery from the following perspectives to substantiate the viability, tangibility of Indian surgical practices:

1. To collect as many archeological, anthropological evidences corroborating with literary descriptions as possible using latest in the respective fields.

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a. Observation by *Fra Paolino Da Bartolomeo* (was an Austrian Carmelite missionary and Orientalist. He is also credited for being the author of first edition of the first Sanskrit grammar to be published in Europe.) on education of children in India.

2. To re-record the reports, testimonies of Indian and foreign accounts of various people who wrote about India to:
  - a. Trace out the continuity of any such surgical practice (described/ mentioned in texts) at least in the rudimentary form, based on Ethno, anthropological studies.
  - b. To re assess and re-affirm already published findings on surgical antiquity and contributions of Indian surgical methods to current surgery, like in the case of Plastic surgery.

Some of the pioneering efforts made in this direction are described here to narrate the viability of the proposed solutions to chronicle the past and present history of surgical practices in *Āyurveda* in a tangible way is presented here:

### I. Archeological, Anthropological evidences to ancient surgical practices.

#### a. First evidence of brain surgery in Bronze Age Harappa

First evidence of brain surgery in Bronze Age Harappa is reported by A. R. Sankhyan and G.R Shug in scientific correspondence to Current science. The communication states that it is the first report of its kind to unequivocally present a case of ancient brain surgical practice, known as trepanation, observed 4300 years ago in a Bronze Age Harappan skull. A decade ago, a Neolithic skull from Burzahom<sup>8</sup> in the Kashmir Valley was reported with multiple trepanations as the first case from the Indian subcontinent. The trepanation, also called trephination or trephining, had been the oldest craniotomic surgical procedure practiced by mankind since the Stone Age by way of drilling or cutting through the skull vault of a living or recently deceased person.<sup>9,13</sup> Though not directly mentioned in any *Āyurveda* classics, an anecdotal description relating to *Jīvaka*<sup>14</sup> notes a brain surgery performed at a later date. This observation is of immense value to Indian surgical history, as it confirms its practice from pre-historic period.

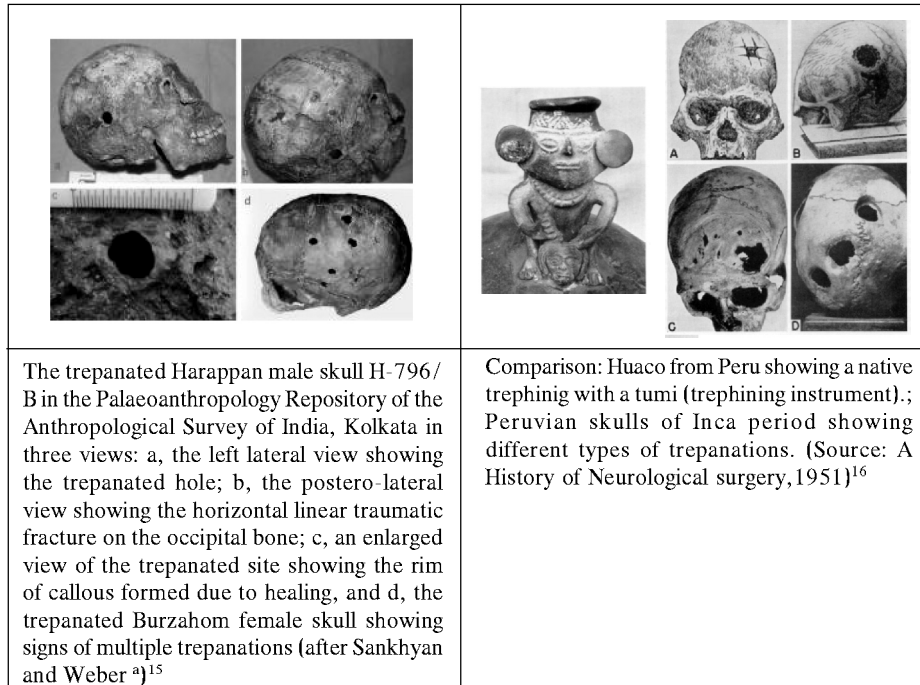
#### b. Surgical instruments at Taxila Museum.

Surgical instruments and accessories are of four main types: *śastra* (cutting instruments), *yantra* (blunt instruments), *upayantra* (accessories), and *anuśastra* (minor instruments).

1. Among *śastra*<sup>b</sup> (cutting instruments) *maṅḍalāgra* (an instrument with a disc-shaped blade) which is to be used for scraping, scarifying and incising operations<sup>19</sup> are reported to be

a. From Sankhyan, A. R. and Weber, W.H.G., Int. J. Osteoarchaeol., 2001, 11, 375-380.; Sankhyan, A. R., J. Anthropol. Surv. India, 2004, 53, 119-126 (in Hindi).; Sankhyan, A. R., In Encyclopaedia of the History of Science, Technology, and Medicine in Non-Western Cultures (ed. Helaine Selin), SpringerLink, 2008, part 19, pp. 2060-2063.

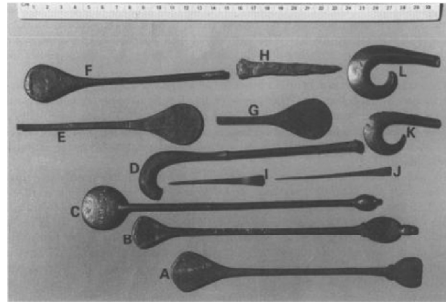
b. *Śastra* (cutting instruments) of different designs are to be employed for different types of incisions, excisions, etc. They are twenty in number (Su. 8, 2-3).



present in the collection of Taxila museum as narrated by Nasim H. Naqvi: six decapitators are mentioned in the Marshall catalogue<sup>20</sup> out of which 3 are in display. Out of them, two lack handles, although both are shown in Marshall's account with handles, which must have been lost at some later stage. Including the handles, their length was recorded as 16.5 cm, without them, they measure about 6 cm and 7.5 cm respectively. They were discovered at two different sites in Sirkap; the third decapitator in display is almost complete and is a robustly constructed instrument of solid copper. It was discovered in the second stratum at Sirkap, dating to the first century A.D.<sup>b</sup> Details of the other three decapitators which are not on display are as follows: Two of these are approximately 5.5 cm in length,

a. From Sankhyan, A. R. and Weber, W. H. G., *Int. J. Osteoarchaeol.*, 2001, 11, 375-380.

b. [Marshall, op. cit., note 2 above, vol. 2, pp. 599-601.] Marshall, Taxila: an illustrated account of archaeological excavations, 3 vols, Cambridge University Press, 1951. Vol. 1 deals with the history of the region and the discovered towns, vol. 2 with archaeology, and vol. 3 contains pictures of the sites and the excavated objects. See vol. 2, pp. 570, 577, 595, 599, and 601, for the quotations and objects discussed in this article.



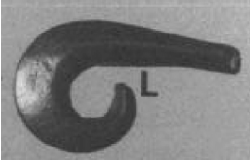


**Surgical instruments in the Taxila Museum. Nasim H. Naqvi., NH - Med Hist (2003)17**

and made of copper sheeting strengthened with copper-wire rib. These fragments were found at the oldest site of Bhir Mound and were dated to the third to second century BC. Third one The third was excavated complete, measuring 17.5 cm in length, and made of solid copper with a round handle ending in a disc. It was discovered at the Sirkap site and pertains to the first century AD.

Important uses of maṅḍalāgra shastra are discussed in detail by G.N. Mukhopadhyaya in his landmark book 'The surgical instruments of Hindus'<sup>22</sup>

- It is recommended to be used in the operative treatment of enlarged tonsil- *galaśuṇḍikā* (*suśrutasaṁhitā, cikitsasthāna, 22/49-50.*)
  - It is also advised to be used for piercing the skull of a dead foetus in-utero to help its easy extraction by other instruments. (*suśrutasaṁhitā, cikitsasthāna, 15/ 12, 16*)
  - In operation of pterygium and other ophthalmic operations such as for vascular network and nodules on the eye ball (*suśrutasaṁhitā, uttarasthāna,15/7*)
  - Scrape away the root of any new growth in the eye (Cakradatta, netrarogacikitsā)
  - Scarifying the tongue for bleeding in the diseases called jihvākaṅṭaka (*akradatta, jihvā roga cikitsā*)
2. *Eśaṇī* (surgical probe) with ends shaped like the head of an earth-worm (blunt) is used for probing and for searching the course of pus-formation in an infected part.<sup>23</sup> Three objects displayed in the Taxila Museum may have been in use as a surgical probe. Amount them two are finely made and in good condition, about 9 cm and 7 cm long. The third is thicker and badly damaged, measuring 6.5 cm, and may not have a surgical application. All are made of pure copper and may have had wooden handles. The date and site of excavation of these probes cannot be ascertained as they are not included in Marshall's catalogue and were probably discovered after the original excavations.

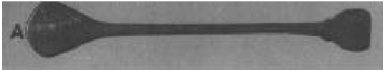

		
Head of a decapitator 8 cm <sup>21</sup>	Decapitator in full length measuring 16.5 cm	Head of decapitator (7 cm)
Decapitators on Display at Taxila Museum (Source: Surgical instruments at Taxila Museum (Nasim 2003))		

3. *Sūcī* (needle with eyes) is used for suturing.<sup>24</sup> Three needles that were discovered at the earliest township of Bhir Mound in stratum IV belonging to the third or second century BC. They are 5 cm to 7 cm in length, and made of copper with a rounded eye.<sup>2</sup>
4. Among *Yantra*<sup>b</sup> *saṃdamśayantra* (gripping instruments<sup>25</sup>-forceps): A copper forceps about 8 cm long looks similar to Greek or Roman forceps. This is made from a single long strip of copper, which is bent in the middle giving a springy quality; a ring below the loop further strengthens its stability. This object is listed but not exhibited.
5. *Tālayantra* (disc with handles- Spatula) of two varieties, - one with a single, and the other with a pair of disc shaped like fish scales. They measure about nine inches and are to be used inside the nose, ears and other orifices of the body. The details of the objects found at Taxila museum belonging to this category are: Marshall listed five spatulas under surgical instruments. All bear a decoration of typical Buddhist design at the end of the handle. One illustrated in his catalogue has a heart shaped hole in the blade, the other two are missing. The remaining two in the display are similar (Fig.1: A and B), having flat, oval blades measuring 22cm and 20cm respectively. All the spatulae were found at Sirkap, in layers associated with the first or second century AD.<sup>a</sup>

a. (Marshall, op. cit., note 2 above, vol. 2,)




b. *Yantra* (blunt instruments) are one hundred of different varieties. The hands of the surgeon should also be included in this category as instruments, and in fact they are said to be foremost in this class as they are employed in every case. The hundred yantras are divided into six main types (*suśrutasaṃhitā*, su. 7, 3-12).

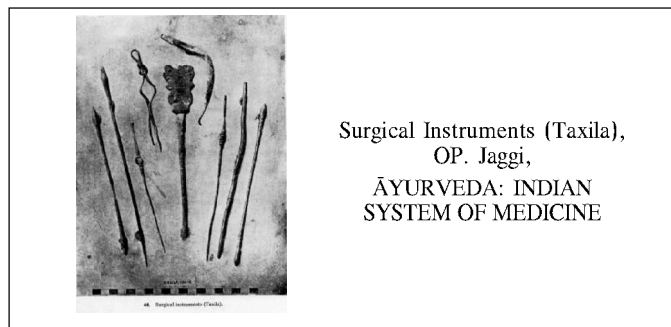


	
22 cm	20 cm
Spatulas on Display at Taxila Museum (Source: Surgical instruments at Taxila Museum (Nasim 2003))	

**6. Other objects probably belonging to the category of ointment applicators, tongue depressors or retractors.**

There are another three objects among the exhibits, these are not listed, dated or described in the catalogue, and must have been discovered during later excavations. Two are similar in shape and size about 13.5 cm and 14.5 cm in length, the third has a shorter handle of 9 cm. All three are made of copper, and have rounded blades of equal size. Their handles are plain and lack any features or decoration, and are square in cross section, quite unlike those of the decapitators and spatula. It is a 11 cm long instrument, listed by Milne as a tongue depressor.

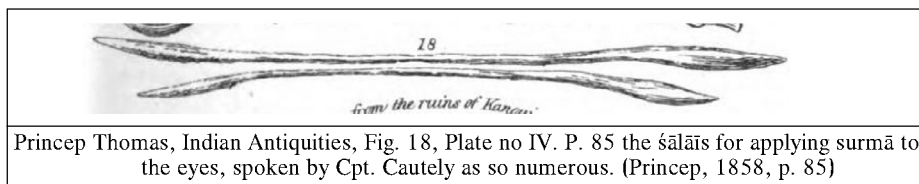
		
13.5 cm	14.5 cm	9 cm
Ointment applicators (copper) on Display at Taxila Museum (Source: Surgical instruments at Taxila Museum (Nasim 2003))		



a. Marshall, op. cit., note 2 above, vol. 2, p. 600.

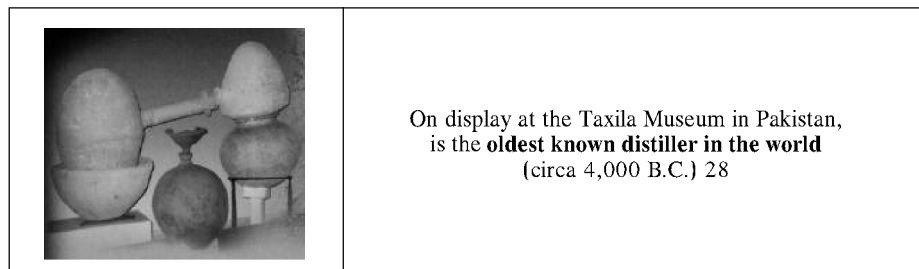
#### Other findings of similar kind:

Princep (1858) reported a copper probe for applying antimony to the eye has been found in the excavations of Bijnos and another in the Behat excavations.<sup>26</sup> B. N. Mukharjee (1913) further noted that pure copper was also used as a material of instruments and vessels and instruments of copper are frequently mentioned in the medical books of the Hindus. He continues to report that *Cakradatta* (*Cakradatta, añjanādhikāra*) advises us to use a copper applicator for the application of *Iekhana* collyrium; and *Suśruta* mentions a copper needle in the operation for reclamation of cataract. (*Suśrutasaṁhitā, uttarasthāna, 17/59.*)<sup>27</sup>



#### 7. Non-surgical pharmaceutical instruments displayed at Taxila museum:

- i. *Mortar and Pestle:* In Taxila a number of pestles and mortars were discovered from pre-Alexandrian site of Bhir Mound and the Greek city of Sirkap. These are made of stone. The mortars were from 15 cm to over 25 cm diameter while there were also numerous pastels of different sizes. (may be used for domestic purpose). There is an unusual saddle shaped grinding slab of stone on display, approximately 40 cm long and 15 cm wide, this might have been used for some special purpose.
- ii. *Condensers:* There are three condensers of various sizes, one almost complete and it has been exhibited assembled roughly in the way it must have been used in real life. The assembled condenser on display stands to a height of about 40 cm.



iii. *Weighing pans and weights*: A complete set of weight made of stone and shaped in spherical balls that was discovered in a shop of a jeweler is exhibited. Something similar might be in use for medical practice as well.

Nasim H. Naqui opines that the instruments on display at Taxila museum indicate the notion that, Indian surgical instruments had no Greek influence, either in design or manufacture. He states the following reasons to establish the argument: 'The design of the instruments displayed in Taxila museum and other associated artifacts appear to be strictly local (not influenced by then prevailing Greek rule in that region). It is also interesting to note that many of these objects were excavated from cities planned by Greek town planners built on grid pattern. It is also extraordinary that Gāndhāra has not yielded any Greek or Roman style instruments. At this juncture it can be safely assumed that till that period the influence of Greek on the local cultural was only on Sculpture, arts and coinage and not on Medical/ Surgical practice in spite of the Presence of Greek artisans in *Gāndhāra* and probable absence of Greek physicians.<sup>29</sup> Another corroborating fact that Indian medicine/ surgery had no apparent influence of Greek medicine is that *Carakasamhitā* did not consider Pulse examination as an important diagnostic tool, which only gained significance during 13th AD.<sup>30</sup> It is important to note that 'the diagnostics of Greek medicine was based on elaborate pulse lore, which was known to be taught from the time of Praxagoras (4th BCE) and by that time Indian subcontinent has sufficient contacts with Greek, still the Greek methods of diagnosis have not influenced Indian medicine.'<sup>31</sup>

#### **Aggaalya's Stone Inscription:**

It is a stone inscription in Telugu-Kannada Script is incised on three sides of a stone pillar set up in the village named Saidapur village, Yadgirigutta mandal (Bhuvanagiri Taluk), Nalgonda District of Andhra Pradesh, India. This inscription which portrays, practice of surgery by select vaidyas in the medieval period, it evidenced by the subjoined inscription, which alludes the greatness of a surgeon named Aggalayya who flourished under the patronage of the Chalukya King Jayasimha II (A.D. 1015-1042).<sup>32</sup>

The editor's note provides further analysis and importance of this rare tangible find with respect to surgical practice in medieval period. The salient observation is as follows: The inscription of immense value to the history of *Āyurveda* particularly in South India; The mention of Aggalayya in an inscription, as a surgeon-physician in this context shows that the practice of surgery was not completely given up by medieval period. ; it provides a glimpse of how surgeons, physicians enjoyed high status during Cālukya King Jayasi mha's

period; Another interesting find, which presents a diametrically opposite perception that, Jain and Buddhist perceptions of Ahimsa hindering the surgical practice. Here the editor opines that Aggalayya, a devout Jaina follower has build a temple for Jina, which was named after his title *Vaidyaratnākara*. It indicates here that, though by faith Aggalayya was a Jaina, it did not stop him from practicing surgery as a profession, that too supported with royal patronage.<sup>33</sup>

**b. Reports, testimonies from Indian and foreign accounts of various people who wrote about India**

**i. Evidences for artisans viz., barbers, brick-makers practicing reconstructive surgery in 18<sup>th</sup> century:**

The first and only record of such resourcefulness is reported by Cully Lyon Lucas<sup>a</sup> an English surgeon who learned the practice of total nasal reconstruction while working in Madras, India in a letter to editor. Gentleman's Magazine, October, 1794,<sup>34</sup> with respect to 'total nasal reconstruction', which has later on revolutionized the practices in plastic surgery. Interestingly the operation was carried out by a brick-maker.<sup>b, 35</sup> According to other Madras Presidency surveys,<sup>c</sup> of those practicing Medicine and Surgery, it was found that such persons belonged to a variety of castes. Amongst them, the barbers, according to British medical men, were the best in Surgery.<sup>36</sup>

**'Vaidu'-blood-letting, village surgeons of Maharashtra**

It is reported that 'vaidu' are hawkers who roam village to village carrying herbs and practice blood letting using a conical copper cup. They call themselves 'Nadi Pariksha Vaidya (the pulse feeling doctor) or '*Mander Mantra Vaidya*' (the medicine vending doctor). The women of these tribes also render medical services and treat children's ailments. They usually prescribe herbs, or bleed the sick with a conical copper cup.<sup>37</sup> The same observations

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- a. from Freshwater, M. F.: More about āB. L.ā and āMr. Lucasā and Mr. Carpue. *Plast. Reconstr. Surg.*, 49:78, 1972. and Foman, S.: *The Surgery of Injury and Plastic Repair*. Baltimore, Williams & Wilkins Co., 1939.
- b. A curious example of the transfer of technology from Pune to London in the 1790s is provided by the Indian practice of plastic surgery. It is perhaps best that I describe it in the words of a founder of modern British plastic surgery, J.C. Carpue, FRS. Carpue wrote in 1816: J.C. Carpue observed: It will be observed, that the whole of the foregoing accounts are agreed upon these points, that the performance of the operation is confined to a particular caste of Hindoos, and that this caste is said to be the Koomas, or potters, or brick-makers (Dharampal, *Essays on Tradition, Recovery and Freedom 2000*, 58)
- c. These surveys began to be made from 1812 onwards, and their main purpose was to find out what numbers of such medical men were in receipt of assignments of revenue. Some details of the castes of these practitioners may be found in Madras Board of Revenue Proceedings of 17 September 1821, and of 9 March 1837, and other proceedings referred to therein

are discussed in detail by Kanjiv lochan, who has discussed about the role of non-elite classes contributing to Ancient Indian Medicine.<sup>38</sup> He presents the observations of Basu (1919) with respect to some poorer communities specializing in herb-vending and blood-letting were noticed in Maharashtra. These people called themselves 'vaidu' (Basu 1919:12; Kosambi 1964:50).

Basu (1919:12) found them begging and professionally at verge of extinction due to public apathy towards their expertise. According to him, they were only partly Hinduized and spoke Telugu among themselves.

Current directories on the Scheduled Tribes (Singh 1994) and Scheduled Castes (Singh 1993) in India do not take notice of any community named 'Vaidu' or the like.<sup>39</sup> It is interesting to note the observations by Marie D'souza that, the profession of these people did not extinct, but still flourishes in Nandurbar Taluka, Dhule District of Maharashtra. In this report it is noted that, now vaidus limit their practice mostly to herbal treatment, surgical measures like bloodletting are not noted.<sup>40</sup>

**ii. Report on established surgical skill among Indian by 18<sup>th</sup> century:** Surgery of India was considered very inferior to English surgery in 18<sup>th</sup> century. In such circumstances, Colonel Kyd reported the success Indian surgeons have achieved in removing ulcers and cutaneous eruptions (of the worst kind), which were a challenge to English Surgeons then.<sup>41</sup>

**iii. Cataract operation, Urololith removal, Plastic surgery:** Dr H. Scott reported the prevalence of plastic surgery in Western India, in his letters to the President of the Royal Society, London. In 1972, he stated that, Indians practiced with great success the operation of depressing the crystalline lens (cataract operation) when become opaque and from time immemorial they have cut for the stone (urolithiasis)<sup>42</sup> which were not practiced in Europe at that time (Dr. H.Scott).<sup>43</sup> Dharmapal<sup>a</sup> cites the following account to disapprove the notion that all these sciences and technologies have wholly disappeared by 18<sup>th</sup> century. Remnants of many still existed and continued to be of use then, which were at a most neglected and impoverished level. For instance, it is said that some aspects of indigenous plastic surgery

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a. Dharmapal(1922-2006), Gandhian thinker, historian and political philosopher from India. He authored *The Beautiful Tree* (1983), *Indian Science and Technology in the Eighteenth Century* (1971) and *Civil Disobedience and Indian Tradition* (1971), among other seminal works, which have led to a radical reappraisal of conventional views of the cultural, scientific and technological achievements of Indian society at the eve of the b. British conquest.

b. W. Adam *On Indigenous Schools Of Learning II.*

were being practiced till fairly recently (up to the end of 19<sup>th</sup> century) in places as far apart as Kangra (Himachalpradesh) and Junagadh (Gujarat).<sup>44</sup> Dharmapal quotes, Dr Buchanan's reporting of a women surgeon from Purneah, Bengal.<sup>b</sup> 'The only practitioner in surgery was an old woman, who had become reputed for extracting the stone from the bladder, which she performed after the manner of the ancients.'<sup>45</sup>

### **Observations, Discussion**

In the attempt to collate the possible tangible evidences of surgical practices in India from the bygone ages, certain important patterns are observed, which are as follows:

- 1 Indigenous Surgical skills were very much in practice in India up to late 19<sup>th</sup> century, which were predominantly practiced by artisans like brick-makers, barbers and even women who actually served as uncrowned custodians of Surgery. It is observed that the ethnographic studies, anthropological studies of later times did not concentrate much to record the surgical practices.
- 2 The reasons for lack of sophistication, further advances can be attributed to the step motherly treatment given by the then learned pundits towards a skillful discipline like śalyatantra which resulted in alienation of actual practice from the theoretical/ practical descriptions provided in classical surgical texts like *Suśrutasaṃhitā*. This apathy, further pushed Indian surgery into oblivion which ultimately lost its sheen today.
- 3 As noted in the Aggalayyas' inscription as late as 11<sup>th</sup> century the Jains, Buddhists were not against surgery. This observation completely contradicts the popular notion that the decline of surgical practice, education was due to the ahimsa doctrine preached by them.
- 4 Lack of medical/ surgical understanding among the Archeologists (working in the initial phases at sites like Harappa, Takṣaśila), whose fetish with larger objects, ornaments and other valuables resulted, and utter negligence of properly examining the minor metallic artifacts, might have resulted in non-identification of surgical instruments. Unfortunately even today the situation remains unchanged, and we do not find any listing of minor metallic objects with finer details in Indian national museums. It is high time to take a serious look at all the collections of minor metallic objects from all reputed museums, individual collection to possibly discover surgical artifacts in line to that of Taxila museum.

It is not unusual to find that the evidences proposed here are very few, but at the same time it must be noted that these are very valuable as they provide the proof of concept

about the antiquity, continuity and future hope for Indian Surgery. The observations of Nasim H. Naqvi are very valuable as they bring to life about the surgical instruments, which would have been in use well before *samhitā* period. Further it is very sad to note that with an exception to the works of Dharampal, nothing much has been attempted to look at the original communications of Colonial period, which has a lot to offer about the rapid decline of Indian surgery, later taken over by western surgery by the beginning of 20<sup>th</sup> century. Understanding this particular period with all the tangible evidences is very crucial to re-discover the practical utilization of great narrations of surgery described in classical *Āyurvedic* texts.

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## सारांश

### प्राचीन भारत में शल्यचिकित्सा अभ्यास के ठोस सबूत

अला नारायण एवं साकेतराम त्रिगुल्ला

प्राचीन भारत में शल्यतन्त्र का प्रयोग साहित्यिक सम्पदा द्वारा निस्सन्देह प्रमाणित तथ्य है, परन्तु इसके समर्थन में बहुत कम मूर्त सामग्री उपलब्ध है। इस कमी की पूर्ति के रूप में कुछ सबूत यहाँ प्रस्तुत किये गये हैं। उनमें से हडप्पा में मिले मस्तिष्क सर्जरी से सम्बन्धित पहले मानवविज्ञान सबूत; तत्कालीन संग्रहालय में शल्य चिकित्सा उपकरणों के पुरातात्विक प्रमाण, जैसे मण्डलाग्रशस्त्र (वर्तुलाकार मुख वाला शस्त्र), एषणी, सूची, संदंशयन्त्र, तालयन्त्र, मल्हम लगाने में प्रयुक्त कुछ शलाका, जीभ के परीक्षण में उपयुक्त साधन, औषध निर्माण में प्रयुक्त सामग्री प्रमुख है। दसवीं शताब्दी के शल्यतन्त्र एवं जैन मतावलम्बी श्री अगलया के बारे में मिला शिलालेख दक्षिण भारत की शल्यतन्त्र धारा का एक ठोस सबूत है। सत्रहवीं एवं अठारहवीं शताब्दी के युरोपीय लेख, उस समय की शल्यतन्त्र की स्थिति का व्यक्तिकरण करते हैं। इनके अनुसार उस समय में शल्यतन्त्र का प्रयोग नाई, ईंट बनाने वाले कारीगर करते थे। शास्त्रोक्त रूप में आयुर्वेद को जानने वाले वैद्य शल्यतन्त्र का अध्ययन, अध्यापन न के बराबर करते थे। इसके कारण शल्यतन्त्र का उपयोग करने वाले कारीगरों एवं शास्त्र को जानने वाले वैद्यों के बीच में वार्तालाप कम हो गया, जो शल्यतन्त्र की प्रगति में अवरोध बन गया। सभी आयामों को परखने के पश्चात्, यह तथ्य सामने आता है कि प्राचीन भारत में शल्यतन्त्र से संबन्धी ठोस सबूत सामने न आने का कारण, भारतीय पुरातत्व के अवशेषों की खोज में जुटे पहले चरण के शोधकर्ता, जिनका ध्यान प्रायः बड़ी मूर्तियों एवं निर्माणों पर ही टिका रहता था। यदि उनकी दृष्टि लोह और अन्य धातुओं से बने छोटे उपकरणों पर रहती तो आज हमारे पास और भी मूर्त सबूत उपलब्ध होते। आज की स्थिति में भी, फिर से एक बार हमारे राष्ट्रीय, एवं निजी संग्रहालयों के लोह और अन्य धातुओं से बने छोटे उपकरणों को फिर से खोजने से, हमें पर्याप्त रूप में प्राचीन भारत में शल्यतन्त्र से सम्बन्धित ठोस प्रमाण मिलने की सम्भावना है।