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A CRITICAL REVIEW OF LITERATURE OF APPENDICITIES W. S. R. TO UNDUKPUCCHA SHOTHA

Dr. Sugate Shridhar[1] and Dr. Baheti Pooja Maesh[2]*

[1]Associate Professor, Dept. of Shalyatantra, Late Kedari Redekar Ayurveda Mahavidyalaya, Gadhinglaj, Maharashtra.

[2]PG Scholar, Dept. of Shalyatantra, Late Kedari Redekar Ayurveda Mahavidyalaya, Gadhinglaj, Maharashtra.

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***Corresponding Author**
Dr. Baheti Pooja Maesh
PG Scholar, Dept. of Shalyatantra, Late Kedari Redekar Ayurveda Mahavidyalaya, Gadhinglaj, Maharashtra.

INTRODUCTION

Acharya Sushruta explains development of various organs in sharir sthana. Among these he explains utpatti of 'unduka' in sharir sthana adhyaya four. In this adhyaya, utpatti of various important organs like heart, lungs, liver are described effectively. Here utpatti of unduka is also mentioned by Acharya Sushruta i.e.

शोणितकिट्ट प्रभवः उण्डुकः ।

सु. शा ४ / २५

It means that Unduka develops from 'shonit kitta'. As we compare development of Liver according to Ayurveda. Acharya's have opined about the genesis of 'Yakruta' (Liver) from Rakta Dhatu (blood tissue).

There are very few and scattered information found in Ayurvedic Literature. In Ayurvedic Literature the word 'Upantra' used rather than Unduka puchchha.

उपान्त्रं लंबते चाथोण्डुकात्स्थूलान्त्रमूर्ध्वगम् ।

ततस्तच्च तिरश्चीनमधोगं च क्रमाद्भवेत् ॥

- अष्टांग शारीरम् २८

उण्डुकस्याधस्तादुपान्त्रमिति च किमपि प्रत्यङ्गं दृश्यते ।

- बृहच्छरीरम् २ / ६

Appendix is attached to Caecum, distal to Caecum, Ascending colon, Transverse colon, Descending colon present respectively.

AYURVEDIYA REVIEW

उण्डुकः पोट्टलक इति लोके ।

- सु.चि. २ डल्हण टिका

Unduka is basically pouch like structure situated at the starting point of Large Intestine.

पक्वाशयैकदेशे विभक्तमलाधारः उण्डुकः अत उण्डुकात् पक्वाशयो भिन्नः ।

सु.शा ५ / ६

चरके पुरीषाधारशब्देन उण्डुकः प्रतिपादितः ।

सु.शा.ड्ल्हण टिका ४ / १५

From above, it is compared to caecum by modern anatomical view. The caecum derives it's name from it's inferior blind- end. Superiorly the caecum is continuous with ascending colon. It is located in the lower right quadrant of the abdominal cavity inferior and lateral to the ileum.

- Embryological Formation of Unduka

शोणितकिट्ट प्रभवः उण्डुकः ।

सु. शा ४ / २५

Unduka is formed by 'Shonit Kitta '.

- Location of Unduka

पित्ताशयात् अधः पक्वाशयः ।

According to Charaka 'Purushadhar 'means Unduka
Pakvashaya i.e. Intestine is situated below the Pittashaya. But again Unduka is different from Pakvashaya.

MODEEN REVIEW

- **Vermiform Appendix**

The vermiform appendix is a narrow, vermiform (worm -like) tube which arises from the postero-medial caecal wall, approximately 2 cm below the end of the ileum. It may occupy one of several positions.

The commonest positions seen in clinical practice are

1) Retrocaecal or Retrocolic -behind the caecum or lower ascending colon respectively.

2) Pelvic or Descending - when the appendix hangs dependently over the pelvic brim, in close relation to the right uterine tube and ovary in females.

3) Subcaecal - below the caecum.

4) Pre or Postilial - anterior or posterior to the terminal ileum respectively are occasionally seen, especially when there is a long appendicular mesentery which allows greater mobility.

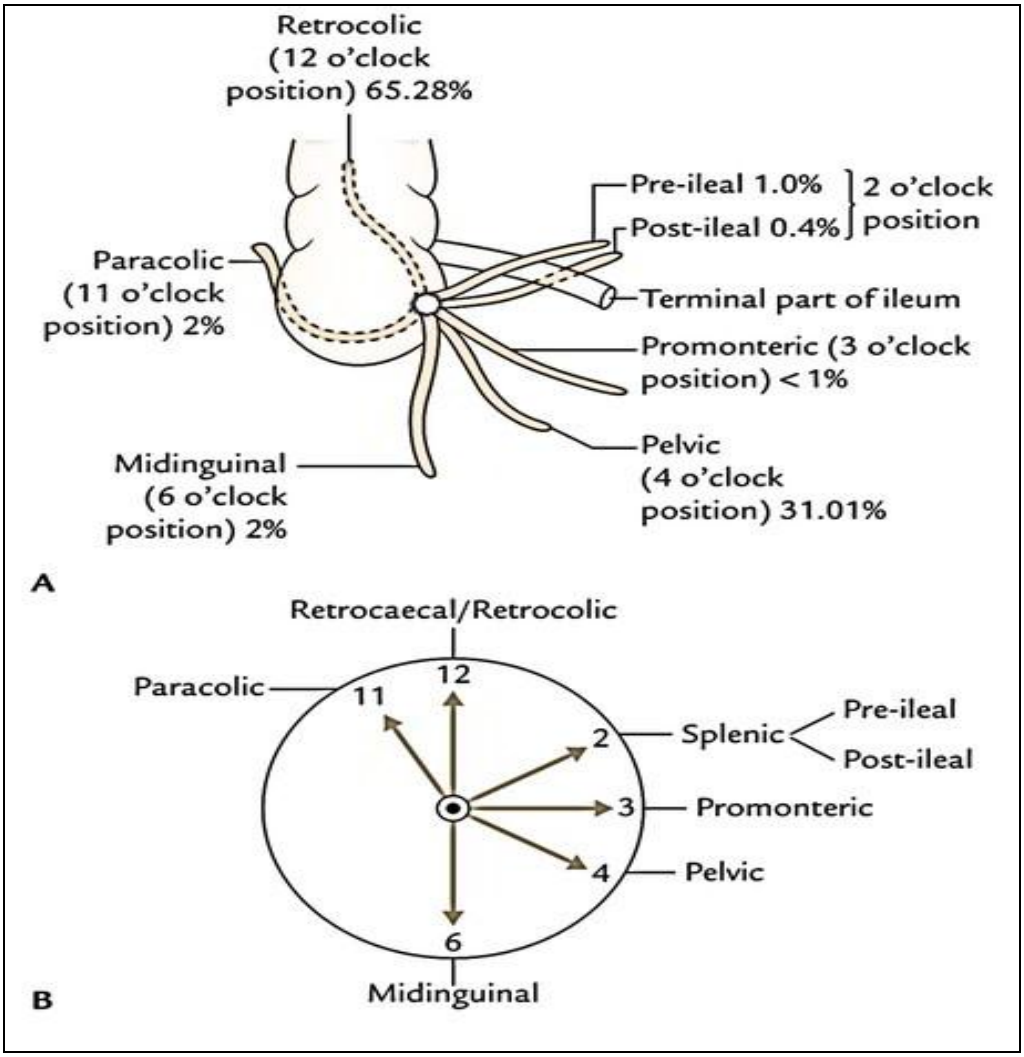

Fig no 2: Position of Appendix.

The three taeniae coli on the ascending colon and caecum converge on the base of the appendix, and merge into its longitudinal muscle. The anterior caecal taenia is usually distinct and can be traced to the appendix, which affords a guide to its location intra -operatively. The appendix varies from 2-20 cm in length; it is often relatively longer in children and may atrophy and shorten after mid-adult life.

It is connected by a short mesoappendix to the lower part of the ileal mesentery. This fold is usually triangular, extending almost to the appendicular tip along the whole viscus.

The lumen of thee appendix is small and opens into the caecum by an orifice lying below and slightly posterior to the ileocaecal opening. The orifice is sometimes guarded by a straight mucosal fold forming an asymmetrical 'valve ' which gives the appendix orifice the appearance of 'strung bow '. This fold tends to lie parallel to the medical wall of the caecum and ileocaecal valve and an imaginary 'arrow' placed in the bow usually points in the direction of the ileocaecal valve; this is a useful sign during colonoscopic examinations. The lumen may be widely patent in early childhood but is often partially or wholly obliterated in the later decades of life.

Blood Supply

The appendicular artery is a branch of the lower division of the ileocolic artery. It runs behind the terminal part of the ileum and enters the mesoappendix at a short distance from its base. Here it gives a recurrent branch which anastomoses with a branch of the posterior caecal artery. The main artery runs towards the tip of the appendix lying at first near to and then in the free border of the mesoappendix. The terminal part of the artery lies actually on the wall of the appendix.

Blood from the appendix is drained by the appendicular, ileocolic and superior mesenteric veins, to the portal vein.

Nerve Supply

Sympathetic nerves are derived from thoracic nine and ten segments through the coeliac plexus. Parasympathetic nerves are derived from the vagus. Referred pain of appendix is felt at umbilicus, similar to that of small intestine and testis.

Lymphatic Drainage

Most of the lymphatics pass directly to the ileocolic nodes, but a few of them pass indirectly through the appendicular nodes situated in the meso-appendix.

APPENDICITIS

There are four types of appendicitis

i) Acute appendicitis

ii) Subacute appendicitis

iii) Recurrent appendicitis

iv) Chronic appendicitis

ACUTE APPENDICITIS

Incidence

Acute appendicitis is the most common acute surgical condition of the abdomen. Acute appendicitis may occur at all ages, but is most commonly seen in the second and third decades of life. It must be noted that there is some relation between the amount of lymphoid tissue in the appendix and incidence of acute appendicitis. Both are pick in the middle of the second decade. In children, appendicitis is not common as the configuration of the appendix makes obstruction of the lumen unlikely. After middle age the risk of developing appendicitis in future is quite small.

There is hardly any difference of sex incidence but this condition seems to be more commonly seen in teenaged girls.

Aetiology and pathogenesis

1. OBSTRUCTION OF THE LUMEN seems to be the dominant factor in production of acute appendicitis. This may occur due to obstruction of the lumen, obstruction in the wall or obstruction from outside the wall.

a) In the lumen faecolith and hyperplasia of submucosal lymphoid follicle are the major causes of obstruction. Other causes are intestinal worms e.g. round worm, thread worm etc, vegetables, fruit seeds, inspissated faeces or barium from previous X-ray. A faecolith is composed of inspissated faecal material, epithelial debris, bacteria and calcium phosphates. Sometimes a foreign body may be incorporated into the mass. Presence of a faecolith is so important that it even provides an indication for prophylactic appendicectomy.

b) In the wall, stricture or neoplasms of which carcinoid is the commonest are the main causes.

c) Outside the wall adhesions and kinks are common in this group.

2. DIET

Diet plays an important part in producing appendicitis. Diet which is relatively rich with fish and meat.

3. SOCIAL STATUS

This disease has been considered to be the disease of aristocratic families.

PATHOLOGY

Acute appendicitis may be obstructive variety or non-obstructive variety.

Obstructive acute appendicitis

Obstruction is the major factor in the production of acute appendicitis. In many cases of early appendicitis the appendix lumen is patent despite the presence of mucosal inflammation and lymphoid hyperplasia. Lymphoid hyperplasia ultimately narrows the lumen of the appendix leading to luminal obstruction. Obstruction increases the severity of the inflammatory process. The sequence of events following obstruction of the appendix is probably as follows.

A closed loop obstruction is produced continuing normal secretion of the appendicular mucosa rapidly produces distension. The luminal capacity of the appendix is very small – 0.1 ml. Secretion of as little as 0.5 ml distal to the block raises the intraluminal pressure to about 50 cm of water. Unfortunately, enough, appendicular mucosa membrane is capable of secreting at high pressure. Such distension stimulates visceral nerve ending concerned with pain. This produces vague, dull and diffuse pain in the umbilical and lower epigastric region according to nerve supply of the appendix (T10). Peristalsis is also stimulated by such sudden distension, which produces cramping pain superimposed on the dull, visceral pain characteristic in early appendicitis. Such distension of appendix with mucus is known as ‘mucocele of appendix’.

Rapid multiplication of the resident bacteria of the appendix also increases distension. Continued mucosal secretion and inflammatory exudation increases intraluminal pressure. Oedema and mucosal ulceration may gradually develop, so that the bacteria may pass into the submucous layer. Resolution may occur at this stage either in the response to antibiotic

therapy or spontaneously. If the intraluminal pressure increase further venules and capillaries are occluded, but arteriolar inflow continues resulting in engorgement and vascular congestion of the appendix. At this stage of distension, reflux nausea and vomiting start, the visceral pain also becomes severe.

Pressure within the organ increases so much that it exceeds venous pressure. Gradually the serosa is involved, more due to presence of hiatus muscularis and local peritonitis ensues. As soon as this develops there is shifting of pain to the right lower quadrant. At this stage the greater omentum and loops of small bowel become adherent to the inflamed appendix preventing the spread of peritoneal contamination. This result in phlegmonous mass or appendicular abscess. Sometimes or very rarely appendicular inflammation may resolve before causing local peritonitis, leaving a distended mucus-filled appendix, known as a mucocele of the appendix.

When this bacterial invasion occurs to the deeper coats, fever, tachycardia and leucocytosis develop as a consequence of absorption of bacterial toxin and dead tissue products. Distension of appendix with pus is known as 'empyema of the appendix'. Gradually distension increases and arteriolar pressure is exceeded. This occurs in localized areas particularly those areas with poorest blood supply. Ellipsoidal infarcts develop more commonly in the tip, antimesenteric border and at the site of impaction of faecolith. Perforation may occur through such infarcts.

SUBACUTE APPENDICITIS

Some episodes of acute appendicitis apparently subside spontaneously before they reach the acute stage. This is called subacute appendicitis. This condition may recur. Presumably obstruction of the lumen due to lymphoid hypertrophy or soft faecolith may spontaneously be relieved allowing subsidence of appendicular inflammation and its attendant symptoms.

RECURRENT APPENDICITIS

If a full-blown appendicitis dose not ensue, the appendix may turn into a 'grumbler' precipitating recurrent attacks. This is known as recurrent appendicitis. These attacks are usually milder. The patients remain symptom-free between attacks and physical examination is normal. Barium enema X-ray often shows normal filling of the appendix due to disappearance of obstruction.

CHRONIC APPENDICITIS

Sometimes pathological examination of the appendix may reveal thickening and scarring suggesting old, healed acute inflammation. This is chronic appendicitis. Patients with such appendicitis often complain of persistent right lower abdominal pain. It must be remembered that the resected appendix must show fibrosis of the appendicular wall, evidence of old mucosal ulceration and scarring and infiltration by chronic inflammatory cells to be designated as chronic appendicitis.

Non obstructive acute appendicitis

This is a less dangerous condition. Inflammation commences in the mucous membrane or in the lymph follicles. Gradually inflammation spreads to the submucosa. The appendix becomes red and congested. The end artery, if involved in such inflammation, its lumen will be thrombosed and localized gangrene will appear. As there is no obstruction there is not much distension, but when the serosa is involved localized peritonitis develops and the patient complains of pain in the right iliac fossa. Such inflammation terminates either by i) suppuration ii) gangrene iii) fibrosis or iv) resolution. Many of the subacute appendicitis, recurrent and chronic appendicitis develop from this variety.

CLINICAL FEATURES

A) Symptoms

i) Pain is present in all patients with appendicitis. The initial typical pain is diffuse and dull and is situated in the umbilical or lower epigastric region. Sometimes the pain is moderately severe. Intermittent cramping may superimpose on such a pain. Gradually the pain is localized in the right lower quadrant. It takes about 1 to 12 hours for such localization. In some patients the pain of appendicitis begins in the right lower quadrant and remains there. Variation in the anatomical position of the appendix will account for variation of the principal site of the pain. In case of retrocaecal appendix, pain may be complained of more in the flank. In case of pelvic appendicitis, pain may be referred to the suprapubic region. Malrotation of the appendix will lead to more confusion of the pain.

ii) Anorexia- Nearly always anorexia is complained of in case of appendicitis. This symptom is so constant that the diagnosis should be questioned if the patient is not anorectic.

iii) Nausea- Typically pain, vomiting and temperature constitutes Murphy's triad of this condition.

iv) The character of bowel function is of little diagnostic value. Many patients give history of constipation before the onset of abdominal pain. A few voluntarily submit that defaecation relieves their pain. To the contrary diarrhoea occurs in some patients, particularly in young children.

B) Physical signs

i) Temperature – Appendicitis may cause rise of temperature, but higher temperature is unusual with uncomplicated appendicitis. Temperature elevation is usually restricted to 99^0 or 100^0.

Normal temperature is often present even with advanced appendicitis. In case of generalized peritonitis following rupture of appendicitis temperature may shoot upto 40^0C.

ii) Pulse rate – The pulse rate is usually normal or slightly elevated. High pulse rate should question the diagnosis. Pulse rate increases in proportion with the temperature of the patient. In case of spreading peritonitis following rupture pulse rate may rise up to 100 per minute.

- **INSPECTION**

The patient looks anxious in pain and the tongue in dry. On careful inspection, in very acute condition, it may disclose some limitation of the respiratory movement of the lower half of the abdomen.

- **PALPATION**

Presence of peritoneal inflammation can be suspected if cough or percussion on the abdominal wall elicits pain. Systemic gentle palpation will detect an area of maximum tenderness that corresponds to the position of the appendix and is usually located in the right lower quadrant at or near McBurney's point. Muscle guarding or resistance to palpation roughly parallel to the severity of the inflammatory process.

Rovsing's sign - Pain in the right lower quadrant is complained of when palpation pressure is exerted in the left lower quadrant. It is also called 'referred rebound tenderness' and when present is quite helpful in supporting the diagnosis. Retrograde displacement of the colonic gas strikes the base of inflamed appendix or displacement of the ilial loops to the right side of the abdomen to irritate the inflamed appendix is the probable explanation of this sign.

Psoas sign - This test is performed by having the patient lie on his left side. The examiner then slowly extends the patient's right thigh, thus stretching the iliopsoas muscle. This will produce pain to make the sign positive. This indicates presence of irritative inflamed appendix in close proximity to the psoas muscle. This is possible in retrocaecal appendicitis.

Obturator test -Passive internal rotation of flexed right thigh with the patient in supine position will elicit pain. This positive obturator sign is diagnostic of pelvic appendicitis.

- **PERCUSSION** -Light percussion on McBurney's point will elicit pain.
- **AUSCULTATION** of the abdomen will reveal meagre or no bowel movement on the right iliac fossa. In spreading peritonitis following rupture of appendix abdomen remains absolutely silent and no bowel sound can be heard.
- **Rectal examination-** This is important and should be performed in every patient suspected of suffering from appendicitis. Its primary function is to exclude any pelvic lesion particularly in females. Its secondary purpose is to elicit tenderness in cases of pelvic appendicitis. In case of pelvic appendicitis there may not be any tenderness on the anterior abdominal wall, so rectal examination is very essential to exclude such appendicitis. When inflamed appendix lies in the pelvis, presence of a mass or tenderness will be present on the right side of the fornix.

There are a number of clinical and laboratory -based scoring systems, of which Alvarado score is most widely used. It is as follows-

- **DISCUSSION AND CONCLUSION**

Undukapuchchha also known as ‘Upantra’ in Samhita’s –

उण्डुकस्याधस्तादुपान्त्र मिति च किमपि प्रत्यंगं दृश्यते ।

- बृहच्छरीरम् ।

The organ situated below caecum is appendix. The appendix sits at the junction of small intestine and large intestine. It’s a thin tube about four inches long. Normally the appendix sits in the lower right abdomen.

- According to some clinical studies Unduka and Undukapuchchha related pathological conditions are observed more in males. Pitta Pradhan people are more prone towards ‘unduka’ and ‘undukapuchchha’ related pathological condition, so it is associated with utpatti of ‘unduka’ i.e. shonit kitta as pitta.

- The vermiform appendix is considered by most to be a vestigial organ, it's importance in surgery results only from its propensity for inflammation, which results in the clinical syndrome known as acute appendicitis. Appendicitis is one of the commonest causes of acute abdomen encountered in surgical practice.
- For appendicitis, Alvarado score is most widely used. When the score is 7 or more it is a case of acute appendicitis and immediate operation is required. When the score is 5 to 6, these are borderline cases. There is huge scope for the Ayurvedic medicine to treat primary and chronic cases of appendicitis.

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