

**A PROSPECTIVE STUDY OF LATERALISED
TRANSVERSE COSMETIC INCISION
APPENDICECTOMY AND LAPAROSCOPIC
APPENDICECTOMY**

By

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In

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INTRODUCTION

INTRODUCTION

It is well known adage that abdomen is a temple of surprises and a magic box as well. Since the abdomen accommodates innumerable viscera and other anatomical complements, diseases of the abdomen constitute a topic full of clinical curiosities. A meticulous examination of abdomen is one of the most rewarding and the diagnostic procedures available to the doctor especially the surgeon helps to plan an ideal treatment. Acute appendicitis is the most common cause of an 'acute abdomen' in young adults and, as such, the associated symptoms and signs have become a paradigm for clinical teaching.¹

Acute appendicitis is the most common acute surgical condition of the abdomen². Approximately 7% of the population will have appendicitis in there life time.³ Acute appendicitis may occur at all ages but most commonly seen in the second and third decades of life⁴.

Despite technological advances, the diagnosis of appendicitis is still based primarily on the patients history & the physical examination. Prompt diagnosis & surgical referral may reduce the risk of perforation & prevent complication.⁵ The mortality rate in non-perforated appendicitis is less than 1%, but it may be as high as 5% as more in young & elderly patients in whom the diagnosis may often be delayed thus making

perforation more likely. Preoperative diagnosis of acute appendicitis is sometimes challenging in young women, children & aged despite all round improvements in medical field & ultrasonography. Diagnostic scores are useful easy methods, which help to reach in decision making⁶. Delay in diagnosis will lead to complication which increases morbidity, whereas overzealous diagnosis may lead to negative appendectomy .

In this era of cosmesis, minimal scar formation is very much fascinated by young patients in the profession of dancing, modeling and those involved in film industry and sports. Apart from cosmesis, small transverse incision results in less pain, early mobility and lesser morbidity than standard incision. Even though laparoscopic appendicectomy provides similar advantage, to adopt laparoscopy in all centers is not feasible due to limitation in expertise, facilities and cost.

This cosmetic incision offers better results post-operatively and avoids requirement of expertise, infrastructure for laparoscopy, thus reducing cost.

Hence, we decided to take up this study to compare the effectiveness of lateral transverse incision versus laparoscopic appendicectomy in all patients in B.L.D.E University's Shri B.M.Patil

Medical College hospital and Research Centre, Bijapur , admitted or coming to surgery O.P.D in whom diagnosis of appendicitis is made.

AIMS &
OBJECTIVES

AIMS AND OBJECTIVES OF THE STUDY

To compare the effectiveness of lateral transverse incision versus laparoscopic appendicectomy.

REVIEW OF
LITERATURE

REVIEW OF LITERATURE

HISTORICAL REVIEW⁷⁻¹⁰

It seems appropriate to enlighten one's mind with historic moments of medicine, which are fascinating. Credit must be given to those who have contributed for the benevolence of mankind. Their pioneer works are an inspiration to the new generations.

Tiberius Caesar allowed Celsus to dissect on the executed criminals and he must have felt the presence of appendix. Aryateus of Cappadocia in 3rd century A.D is reputed to have described accurately appendicular abscesses and cured the patients by incision & drainage of the abscess through the abdominal wall.

In 1492, Leonardo de Vinci clearly depicted the organ in his anatomical drawings. He called it "Orchid" literally an ear to denote the auricular appendage of the caecum.

In 1521, Berengario D A Carpi, first described the organ.

In 1530, Vido Vidius, first named the worm- like organ as the vermiform appendix.

In 1530, Great scholar, Erasmus, was the first to record case of appendicitis with abscess formation.

In 1543, Andreas Vesalius, illustrated the normal appendix in his 'De Humani corporis Fabrica'.

In 1554, Zeanfernel, French physician described a case of perforated appendix after an autopsy on 7 year girl who had suffered from diarrhea and was given large quince to stop her bowels.

In 1652, Hiden, a leading German surgeon gave detailed account of diseased inflamed appendix, after autopsy on a young man who died after several years of progressive intestinal pain. The appendix was shrunken & drawn into a small bowel completely filling it, so that no contents could be forced into the colon, therefore such pain, appendix was inflamed & swollen throughout.

In 1710, Verneys was the first to coin the term appendix vermiformis, the first description of appendicitis.

In 1711, Lorenz Hiester gave the first good description of a case of acute appendicitis, postmortem on a executed criminal. Morgagni (1719) illustrated beautifully in his 'Adversaria Anatomica'.

In 1755, Lorenz Hiester, professor at Helmstedt recognized that appendix might be the site of acute primary inflammation.

The first reported appendectomy was by Claudius Amyand, surgeon at St. George's Hospital London in 1735. It was the first occasion on which the appendix was successfully removed from the living subject. He removed from a hernial sac an appendix that had been perforated by pin. By the end of the 18th century the appendix was recognized anatomically and that it could become inflamed and cause serious, even fatal results. But symptoms were unrecognized and appropriate surgical treatment was a long way off.

John Parkinson in 1812, recorded a proven case of acute appendicitis. A 5 year old boy died, 48 hours after the onset of acute abdominal pain and vomiting. At autopsy an actually inflamed appendix which contained a faecolith, was found. He stated that no disease was present in the caecum or proximal appendix but was in the appendiceal tip.

In 1824, French physician Louyer Villermay was the first to prove that the appendix could be the site of inflammation based on study of 2 young men who died shortly after onset of abdominal pain. Each was found to have a gangrenous appendix & normal caecum. Melier in 1827 confirmed these findings.

Baron Gullaume Dupuytren & Goldbeck (1830), promoted the theory that inflammation arose in the cellular tissue surrounding the caecum known as typhlitis & perityphlitis.

In 1884, Samuel Fenwick in London exhorted the surgical community to operate upon a perforated appendix as soon as the diagnosis was always certain.

In 1886, Fitz, professor of medicine at Harvard who gave a lucid and logical description of the clinical feature & described in detail the pathological changes of the disease; was also the first one to use the term appendicitis.

In 1880, Lawson Tait, a pioneer of abdominal surgery in Great Britain, performed first planned appendectomy on girl with an appendiceal abscess. She had recurrent pain in right iliac fossa. This milestone in history of appendicitis was not reported by Tait till 1890. Later John Shepherd rediscovered, Tait's important contribution. In 1887, Morton of Philadelphia successfully diagnosed & excised an acutely inflamed appendix within an abscess cavity.

In 1889, Charles McBurney described the pathological changes in appendicitis. In 1902, Albert Ochsner, surgeon from Chicago & Sherren at the London hospital recommended a conservative approach to patient

with generalized peritonitis following perforated appendix, to allow the inflammatory process to localize before considering any operation.

In 1905, Rockey described a transverse skin incision which, Elliot had done in 1896.

In 1905, Murphy clearly described the appropriate sequence of symptoms of pain followed by nausea and vomiting with fever and exaggerated local tenderness at the position occupied by the appendix.

In 1982, Semm is widely credited with performing the 1st successful laparoscopic appendicectomy.¹¹

Teicher I et al (1983), described problems related to the confusing diagnosis of acute appendicitis as evidenced by negative laparotomy rate to assess the feasibility of this decreasing the diagnostic error in scoring system was made to aid in the diagnosis of acute appendicitis and concluded that the scoring system could have eliminated over 1/3rd of unnecessary laparotomies or appendectomies.¹²

Arnbjornsson E (1983), described the role of dietary fiber as the cause of acute appendicitis was evaluated. By means of food diaries, the average daily fiber consumption was determined in 31 patients with acute appendicitis & in 30 control patients, matched for age & sex. The average daily dietary fiber intake was 17.4 gm in the group with appendicitis and

21 gm in the control group, the difference is statistically significant the result which supports the hypothesis that diet in particular, lack of fiber may be an important factor in the pathogenesis of acute appendicitis.¹³

Alvarado A et al (1986), described practical scoring system which included localized tenderness in right lower quadrant, leukocytosis, migration of pain i.e. shift to left, temperature elevation ,nausea ,vomiting ,anorexia & direct rebound pain and the score helped in interpreting the confusing picture of acute appendicitis¹⁴.

Puyleart JBCM et al (1986), used ultrasonography as a tool to diagnose appendix. Ultrasonography was performed with 5 MHz or 7.5 MHz transducer using graded compression technique appendix was visualized & diameter thickness, free fluid, ileus, tenderness at Mc Burneys point¹⁵.

Abu - Yousef MM et al (1989), used high resolution 5 to7.5 MHz transducer to compress the bowels to displace the interfering gas in the right lower quadrant and directly visualized the inflamed appendix with the sensitivity that varies from 80 to 95%. A specificity of 95 to 100% & an accuracy of 91 to 95%. It was also possible to differentiate acute appendicitis from the gangrenous & a perforated appendix.¹⁶

Addis et al (1990) studied the lifetime rate of appendectomy and suggested as 21% for men & 25% for women , approximately 7% of all people undergoing appendectomy for acute appendicitis³.

Fingerhut A et al (1999), described diagnosis has been advocated as a potential tool to decide the number of negative appendectomies performed. However the morbidity associated with laparoscopic and general anesthesia is acceptable only if pathology requiring surgical treatment present, and is amenable to laparoscopic techniques. The question of leaving a normal appendix in situ is controversial one 17% to 27% of normal appendices at exploration had pathological and histological findings.¹⁷

Sudhir Kumar Mohanty et al (2000), quoted that modified Alvarado's score combined with ultrasound can be used as a cheap inexpensive way of confirming acute appendicitis, thus reducing negative appendectomy rate¹⁸.

Enochsson L et al (2001), quoted that laparoscopic appendectomy may be beneficial in obese patients in whom it may be difficult to gain adequate access through a small right lower quadrant incision. Additionally there may be a decrease in risk of postoperative wound infection after laparoscopic appendectomy in obese patients¹⁹.

Bhattacharjee PK et al (2002), did a study on modified Alvarado score and concluded that score was found to be a dependable aid both in pre-operative diagnosis of acute appendicitis and in the reduction of negative appendectomy²⁰.

De U De Krishna K (2004), reported a case having right lower quadrant abdominal pain in a 26 year old female who underwent appendectomy one year back. Recurrent appendicitis should be considered in the differential diagnosis of right lower quadrant abdominal pain²¹.

Nguyen NT et al (2004), analyzed the outcomes of laparoscopic versus open appendectomy. He obtained data from the university health system consortium clinical data base for all patients who underwent appendectomy for acute and perforated appendicitis between 1999 and 2003 (n=60236). Trends in utilization of laparoscopic appendectomy were examined over the 5 year period. Over all 41,085 patients underwent open appendectomy and 19,151 patients underwent laparoscopic appendectomy the percentage of appendectomy performed by a laparoscopy increased from 20% in 1999 to 43% in 2003 . Compared with patients who underwent open appendectomy, patients who underwent laparoscopic appendectomy were more likely female, more likely white, had a lower severity of illness and were less

likely to have perforated appendicitis. Laparoscopic appendectomy was associated with a shorter length of hospital stay (2.5 days vs. 3.4 days) lower rate of 30 days re-admission (1.0% vs 1.3%) and a lower rate of overall complication (6.1% vs. 9.6). There was no significant difference in the observed to expected mortality ratio between laparoscopic and open appendectomy (0.5 vs. 0.6). The mean cost per case was similar between the two groups²².

Das MK, Roy H; From Department of Surgery, Medical College, Kolkata, in 2008, described a preliminary report on retrospective study of lateralized transverse cosmetic incision appendectomy. In this study 105 patients underwent appendectomy by lateralised transverse cosmetic incision over a period from January, 2005 to September, 2007. Six patients developed complications like wound infection and fever. Wound infection was managed with antibiotics, postoperative pain with simple analgesics like tramadol hydrochloride and paracetamol.²³ They concluded that cosmetic incision possesses maximum economic benefit. Even laparoscopic method takes more time, cost and skilled personnel.

Malik AH, Wani RA, Saima BD, Wani MY; From Shri Maharaja Hari Singh Hospital, GMC, Srinagar, Kashmir, in 2007, conducted a randomized controlled trial involving a small lateral access as an alternative approach to appendicitis in paediatric patients. One hundred

and twenty patients, aged between 3 and 18 years, were randomized to receive either small access appendectomy (SAA) ($n = 60$, 53 acute appendicitis and 7 interval appendectomy) or conventional appendectomy (CAP) ($n = 60$, 55 acute appendicitis and 5 interval appendectomy). SAA was performed through an incision in the lateral 1/3 of the spino-umbilical line, lateral to McBurney's point. The caecum along with the appendix could be delivered through this small incision easily as the ileal loops did not interfere with the delivery. All patients suspected of acute appendicitis were evaluated by the modified Alvarado's system to reduce the rate of negative appendectomies. Patients with diffuse peritonitis were excluded. They concluded that small access appendectomy can be done safely without the need for any special equipment, with definite advantages over conventional appendectomy.²⁴

Shasin SK, Dhar S; From Department of surgery, Govt. Medical College, Jammu, J&K, in 2005, in their study they performed appendectomy in emergency successfully in 100 cases, 45 males and 55 females in the age group of 11-63 years with the help of a small transverse incision 2.5 to 3 cm long in the right lower abdomen starting just on the lateral border of rectus muscle and extended laterally in the line of Mc Burney's point. The only muscle in the operation field was rectus that was retracted medially. No other muscle was cut/splitted. The

time taken to complete the operation was 17.4 minutes (13 to 45 mt), post-operative analgesics used were 2.13 dose per patient (2-5 doses), post-operative hospital stay of 2.3 days (2-7 days). There was no mortality and negligible morbidity in the form of wound infection (n=04), anterior abdominal wall haematoma (n=04), subcutaneous emphysema (01). Better cosmesis and almost invisible scar is the hallmark of small incision appendectomy that is what we have observed in the study. Time to return to work (RTW) was 8.2 days (7-10 days). No complication was seen in follow up period extending from 15 days to 06 months. Success rate of small incision appendectomy was 96% with 04 cases requiring extension of incision to maximum 4 cm. They gave it the name of Mini-appendectomy.²⁵

REGIONAL ANATOMY

GENERAL CONSIDERATION

Abdomen is divided into 9 quadrants by 2 vertical and 2 horizontal lines. The vertical lines pass through midclavicular line and midinguinal points. The horizontal lines are transpyloric and transtubercular. Transpyloric line is a horizontal line passing through the tip of 9th costal cartilage on each side. Transtubercular is a horizontal line joining the both tubercles of the iliac crest.

Right iliac fossa is the right lateral and above the lower most quadrant. The anterior wall is formed by external oblique, transverse abdominal muscles and is fascia transversalis. The psoas and quadratus lumborum muscles and thoraco lumbar fascia form posterior wall and inferiorly it is bounded by the posterior part of the ileum and iliacus muscles. Lateral wall formed by external oblique internal oblique transverse abdominal fascia transversalis and inferiorly by iliac bone covered by iliac muscles.

Appendix²⁶⁻²⁹

Vermiform appendix is found only in man, certain anthropoid apes and the wombat. The appendix lies at the commencement of the large intestine into the right iliac fossa.

EMBRYOLOGY OF THE APPENDIX

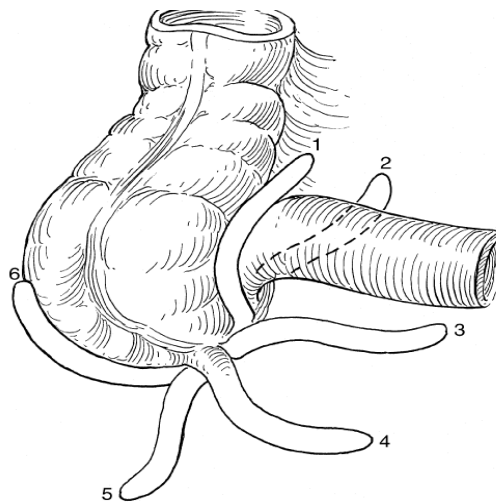
Caecal bud is a diverticulum that arises from the posterior segment of the midgut loop the caecum and the appendix are formed by enlargement of this bud. The proximal part of the bud grows rapidly to form the caecum. Its distal part remains narrow and forms the appendix

As the small diverticulum the appendix appears in 6th week of intrauterine life and is found at the apex of caecum at an early stage. The appendix is formed medially by excessive growth of the right wall of the caecum.

Position of the appendix:

The location of the base of the appendix is dependent on the position of the caecum. The base is attached to the posterior medial surface of the caecum 2.5cm below the ileo-caecal junction at a site where the 3 tinea coli coalesce. The remaining portion is free. In relation to the anterior abdominal wall lies base which is situated 1/3rd or way up the joining right anterior surface iliac spine to the umbilicus (Mc Burney point) in incomplete rotation of the bowel caecum may lie at the higher level beneath the liver in relation to duodenum and gall bladder in this position signs symptoms of acute appendicitis mimic acute cholecystitis. When the caecum is long and mobile the appendix may lie in the pelvis, in which case the tenderness in acute appendix is found maximally on pelvis examination. Very occasionally caecum and appendix lie in the left iliac fossa in which cases acute appendix mimic acute diverticulitis of sigmoid colon. The position of the tip of the appendix in relation to the caecum is variable and has been likened to hands of a clock. The various positions are:

1. 12o clock retrocaecal position - 74%
2. 10o clock paracaecal position - 2%
3. 2o clock preileal -1% , post ileal - 5%
4. 5o clock pelvic - 21%
5. 6o clock subcaecal- 1.5%



The appendix varies considerably in length and circumference. The average length is between 7.5 to 10cms. Specimens of over 30cms in length have been recorded. The appendix in males average 0.5cms longer in length than in females.

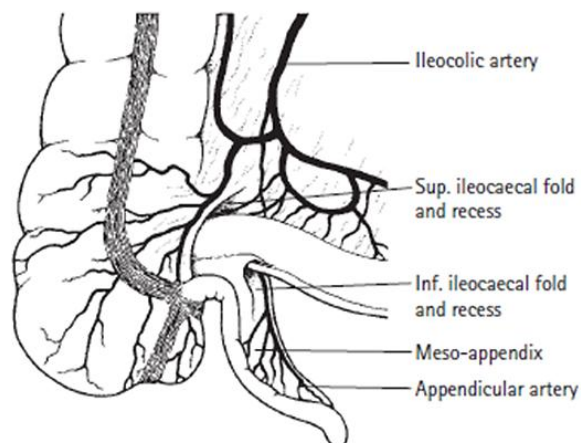


Figure: Mesoappendix displayed demonstrating the appendicular artery.

The lumen which should admit a matchstick is irregular being encroached upon by the multiple longitudinal folds of mucous membrane. Appendix has short mesentery of its own. The mesoappendix that springs from lower surface of mesentery is subject to great variation. Some times as much as distal 1/3rd of the appendix is free from mesoappendix. Especially in childhood the mesoappendix is so transparent that the contained blood vessels can be seen. In many adults it becomes laden with the fat which obscures these vessels.

BLOOD VESSELS

The appendicular artery a branch of lower division of the ileocolic artery passes behind the terminal ileum to enter the mesoappendix a short distance from the base of the appendix. It then becomes to lie in the free border of mesoappendix but for a variable distance from the tip where the mesoappendix is lacking, the artery lies directly on the muscle wall beneath the peritoneal coat. An accessory appendicular artery, a branch of posterior caecal artery may be present but in most people once the appendicular artery reaches the wall of the appendix proper it becomes an end artery. Thrombosis of the artery as a result of appendicitis causes necrosis of appendix. The appendicular vein which follows the appendicular artery along the free border of the mesoappendix drains into the ileocolic which is a tributary of inferior mesenteric vein. Inflammatory thrombus may cause suppurating pyelophlebitis in case of gangrenous appendicitis.



LYMPHATIC VESSELS

Lymphatic vessels transverse the mesoappendix to empty into the iliececal lymph nodes through a number of mesenteric nodes they drain to superior mesenteric nodes.

NERVE SUPPLY

Derived from sympathetic and parasympathetic nerves from superior mesenteric plexus. Afferent nerve fibers concerned with conduction of visceral pain from appendix are to believe to accompany the sympathetic nerve and enter the spinal cord at the level of 10th thoracic segment.

MICROSCOPIC APPEARANCE³⁰⁻³¹

Appendix is lined by columnar intestinal mucosa of colonic type. Crypts are present but not many. In the base of crypts lie the special cells Kulchitzky cells which give rise to carcinoid tumors. Appendicitis can be caused by them.

The submucosa contains numerous lymphatic aggregation (follicles). Those may be the cause for appendicitis. The muscular coat consists of 2 complete layers of smooth muscle inner muscular and outer longitudinal. The latter is formed by the joining together of taenia-coli at

the base of the appendix. The visceral layer of peritoneum envelops the appendix complete excepts for the narrow line of attachment of the mesoappendix.



Figure: Normal vermiform appendix. The narrow lumen is bounded by mucosa which may be arranged in in folds. There is usually abundant lymphoid tissue in the mucosa, especially in younger individuals. This may encroach on and further narrow the lumen. The mucosa is bounded by a relatively thin muscularis mucosa.

CONGENITAL ANOMALIES⁴

1. Agenesis incidence 1 in 100000 persons
2. Duplication few cases of double appendix are reported.
3. Left sided appendix in sinus inversus viscerum where there is complete transposition of thoracic and abdominal viscera. Occurs in 1 in 35000 persons.

FUNCTIONS OF HUMAN APPENDIX³²⁻³⁵

1. Embryological
2. Physiological
3. Microbiological
4. Biochemical
5. Immunological

1. Embryological

During the 5th fetal week , it is the appendix which develops from a bud at the junction of small and the large bowel and undergoes rapid growth into a pouch. In the 6th week there is transient nubbin surmounting the pouch indicating of being involved in the rapid development of the pouch . It is only after the 5th fetal month that the proximal end of this

pouch starts growing differentially to give rise to the true caecum which continues to develop into infancy.

2. Physiology

The goblet cells lining the appendix and adjacent caecum and colon secrete a special type of mucus which can be regarded as an antibacterial paint controlling the organisms which develop in the bowel in the region. The paint contains a high concentration of IgA type immunoglobulins, secretory antibodies produced for mucosal or surface immunity and part of the bowel blood barrier.

3. Bacteriological

Through the cells within and over lining the lymphoid follicles and their production of secretory and humoral antibodies, the appendix would be involved in the control of which essential bacteria come to re-arise in the caecum and colon in the neonatal life. As well it would be involved in the development of systemic tolerance to certain antigenic agent within the alimentary track whether they are derived from bacteria, food stuff or even the body's own proteolytic enzymes.

4. Biochemical

One in three hundred or so appendicectomy specimen contain a carcinoid tumour composed of highly specialized type of cell rich in

serotonin. The exact function of such agent in the entire bowel is still being elucidated but the fact majority of such tumours within the appendix.

5. Immunology

This the area where the appendix would seem to have its predominant function is due to its content of lymphoid follicle . Although it was thought the appendix itself would be the site for B lymphocytes induction. The appendix still have a role in this highly significant function but not alone and its lymphoid tissue is known to be involved in the antibodies production. These antibodies are of two types:

- i) IgA type immunoglobulins for secretory or mucosal surface immunity.
- ii) IgM and IgG immunoglobulins for humoral or blood stream immunity.

The above type function have proven the appendix to be part of the G.A.L.T (Gut associated lymphatic tissue).

ETIOLOGY²⁴⁻²⁵

The riddle of the appendicitis- its actual cause and its meteoric rise from an insignificant disease to the most common serious intraabdominal

inflammatory affection of western civilized raises has been a matter for much speculation. So far no satisfactory explanation has been forthcoming. The following etiological factors are important but for the most part they are purely contributed:

AGE INCIDENCE:- Appendicitis is common in second decade

SEX:- males are affected more commonly than females

RACE AND DIET⁴:-

Appendicitis is common in the highly civilized European, American and Australian countries ,while it is rare in Asiatics, African and Polynesians.

Rendle short, showed that if individual from there later races migrate to countries where appendicitis is common they soon acquire the local susceptibility to the disease . This is contributed to diet rich in meat and scanty in cellulose.

SOCIAL STATUS

Acute appendicitis is more common between the upper and middle classes than those belonging to working class. The use of water closets instead of squatting position in defection has been said to increase incidence of appendicitis.

FAMILIAL SUSCEPTIBILITY

This can be accounted for by hereditary abnormality in position of the organ which predispose to infection. Thus the whole family may have long retrocaecal appendix with comparatively poor blood supply.

OBSTRUCTION TO THE LUMEN OF THE APPENDIX⁴

When an acutely inflamed appendix has been removed some form of obstructing to its lumen can be demonstrated in 80% of cases.

Obstructing agents are:

1) IN THE LUMEN - faecolith and hyperplasia of submucosal lymphoid . They are laminated composed of inspissated faecal material, calcium, and magnesium phosphate and carbonates. Bacteria and epithelial debris. Rarely a foreign body is incorporated in the mass. The presence of fecoliths postulates some form of appendicular stasis which may be related to initial swelling of the lymphoid tissue causing partial obstruction to the lumen of the organ. Radiological demonstration of a stone is an absolute indication for surgery irrespective of signs and symptoms. Worms like round worm threadworm, pinworm and parasites can occlude the lumen and foreign body like pin, inspissated barium from previous studies also contribute.

2) **IN THE WALL** -Stricture due to fibrosis from earlier inflammation or neoplasm of which the carcinoid is the commonest cause.

3) Adhesions and kinking outside the wall

DISTAL OBSTRUCTION OF THE COLON

Acute appendicitis can result from an obstructing (colon) carcinoma usually of the right colon, usually in the elderly cases.

ABUSE OF PURGATIVES

Ingestion of purgatives especially castor oil by patients with ‘stomach ache’ and the violent peristaltic action which results, favors, and often determines, perforation of the inflamed appendix . “Purgation means Perforation” is a wise adage.

SEASONAL FACTORS

Particularly in children a possible association between respiratory tract infection and acute appendicitis exists. Involvement of lymphoid tissue in the tonsils and appendix may occur simultaneously. A blood borne infection may be present in these cases.

BACTERIAL FACTORS

While appendicitis is clearly associated with bacterial proliferation within the appendix no single organism is responsible, a mixed growth of

aerobic and anaerobic organism are responsible. The most common organisms present are a mixture of E Coli(85%) , enterococci(30%) , non hemolytic streptococci, anaerobic streptococci together with clostridium welchi (30%) and bacteroids.

VIRAL FACTORS

An acute viral infection at the time of or just before appendicitis might lead to lymphoid hyperplasia and subsequent healing might produce scarring, kinking etc. leading to acute obstruction. This it is the effect but not the direct cause.

Recently Cytomegalovirus appendicitis has been recognized in patients with HIV. Tucker and colleagues reported the 1st case which had perforated appendix with periappendicular abscess due to E coli . Intranuclear inclusions indicative of CMV infection were throughout the mucosa and submucosa of appendix. Davidson and colleagues reported 2 cases.

TUBERCULOSIS OF THE APPENDIX³⁶

It has been seldom reported after introduction of antitubercular drugs. Borrow and Fried men (1952) had reviewed 265 cases, but majority were diagnosed at post mortem examination of proved cases of tuberculosis. Two types have been described. Ulcerative and hyperplastic (Koster &

Kosman1934) .Tuberculosis of appendix may present as mass in right iliac fossa indistinguishable from ileo-cecal tuberculosis

OTHER RARE CAUSES

1. Appendicitis complicating regional ileitis (Crohns disease)
2. Carcinoid tumour of the appendix
3. Primary adenocarcinoma of the appendix

These are diagnosed only by histological examination.

PATHOLOGY^{29,37}

The menace of acute appendicitis lies in the frequency with which the peritoneal cavity is infected from the focus:

1. By perforation.
2. By transmigration of bacteria through the appendicular wall.

During the several hours between onset of acute appendicitis and rupture, nature's walling off process is able to quarantine the inflammation in about 95% of patients and confine the spill to the periappendiceal area. The greater omentum attempts to seal off the spread of peritoneal invasion, while violent peristalsis from the ingested purgatives tend to spread it. Obviously if the inflammed appendix lies freely dangling , the

threat of peritonitis is increased and early perforation occurs and rapidly diffusing peritonitis is inevitable. An inflammatory mass consisting of matted intestine and omentum with little or no pus is formed if walling off process is completed. In some patients however a progressive suppurative process produces an expanding collection of pus contained by the walling off process - a periappendicular abscess.

Two types of appendicitis are known:

A. NON OBSTRUCTIVE ACUTE APPENDICITIS:

The inflammation mostly due to bacterial invasion usually commences in mucous membrane, less often in the lymph follicles and can terminate in one of the following ways.

- 1 Resolution
- 2 Ulceration
- 3 Suppuration
- 4 Fibrosis
- 5 Gangrene

Once infection reaches the loose submucous tissues it progresses rapidly. The organ becomes turgid, dusky red and hemorrhages occurs into the mucus membrane. The vascular supply of the distal part of the

appendix is often in jeopardy because at this point the artery is intramural and liable to occlusion by inflammation or thrombosis. This may lead to gangrene of the tip. In some cases, the swelling of the lymphoid tissue in appendix may lead to obstruction of the lumen proceeding to obstructive appendicitis.

Non-obstructive appendicitis may progress sufficiently slowly for protective barriers to form, and the resulting peritonitis is localized. In many instances the infection never progress beyond the mucous lining (i .e. catarrhal inflammation) but although the attack passes off, it is unlikely that a status quo ante is ever regained. Because the tip suffers most, after the resolution of the attack, fibrosis usually occurs there in and a shrunken tip is classically finding in recurrent appendicitis.

B. OBSTRUCTIVE ACUTE APPENDICITIS

When the appendix becomes obstructed the process of events begins with the accumulation of normal mucus secretion, proceeds to proliferation of contained bacteria and the pressure atrophy of the mucosa, which allows bacterial access to the deeper tissue planes and continues with inflammation of the walls of the appendix with the vessel thrombosis which because of end artery system leads to

inevitably to gangrene and then perforation of the necrotic appendix wall. Often within 12 to 18 hours the appendix distal to the obstruction becomes gangrenous. Close examination of gangrenous appendices, directly after their removal shows conclusively that they usually belong to the obstructive group³⁰.

Perforation occurs most often at the site of impacted fecolith, before protective adhesions have had time to form. The escaping purulent and gaseous contents are under higher pressure and early wide spread peritonitis is liable to ensue. Subphrenic and pelvic abscesses are common later sequel if the patient survives, the initial peritonitis. An even more lethal form of peritonitis is formed by secondary rupture of the intraabdominal abscess produced by rupture appendicitis. Ascending septic thrombophlebitis of the portal venous system – pylophlebitis, is a very grave but unfortunately rare complication of gangrenous appendicitis. Septic clots from the involved mesenteric radicals embolise the liver producing multiple pyogenic abscesses. When acute inflammation subsides adhesions form and kinking of appendix leads to obstructive appendicitis. Fibrosis of the wall from previous attacks of appendicitis can contribute by narrowing the lumen and promoting fecolith impaction and rarely appendicitis accompanies ileo ceacal Crohn's disease.

When the obstruction is partial and not complicated by infection “mucocele of the appendix” is formed.

Less common pathological conditions of the appendix

- 1 Mucocele of appendix
- 2 Diverticula of appendix
- 3 Intussusception of appendix
- 4 Endometriosis of appendix
- 5 Primary Crohn’s disease of appendix

CLINICAL FEATURES AND DIAGNOSIS

AGE INCIDENCE:²⁵

Rare before the age of two acute appendicitis becomes increasingly common during childhood and adolescence. The maximum incidence is between the age 20 and 30. Thereafter is gradual decline but no age exempted. In infancy the lumen of the appendix is large in relation to intestine and its lumen opens freely into the caecum. In old age the appendix undergoes involution .

CLINICAL FEATURES^{26,29,37}

NON OBSTRUCTIVE ACUTE APPENDICITIS:

There are typically 5 specific features

ABDOMINAL PAIN , WHICH SHIFTS:

Usually the first symptom is pain around the umbilicus in the epigastrium or it may be generalized , this is visceral pain and is therefore somewhat vague. It is due to distension of appendix . The pain is constant. After few hours the pain shifts to the point where the inflamed appendix irritates the parietal peritoneum ,which is sensitive. The pain is somatic or peritoneal, accurately localized and constant . Coughing causes local pain in acute appendicitis but not in case of a stone in the ureter.

FEVER:

With corresponding increase in pulse rate 80-90 is usual . In severe cases temperature and pulse rate is even more.

Upset of gastric function: Protective pyloro-spasm occurs and anorexia , nausea, infrequent vomiting, a brown furred tongue and a foul breath may manifest this. Typically the vomiting is of short duration and

stops as soon the stomach is empty. In majority of instance the patient is constipated but occasionally diarrhea occur, especially in the very young or when the appendix lies in the post ileal or pelvic position.

LOCALIZED TENDERNESS AT THE SITE OF APPENDIX

As soon as the pain has shifted, there is localized tenderness either at McBurney point or elsewhere, as determine by the site of the appendix. These determine the operative approach.

Mc Burney (1889) has stated ,the seat of greater pain determined by the pressure of one fingered, has been very exactly between an inch and a half to 2 inches from the anterior superior iliac spine in a straight line drawn from that process to umbilicus (Shephard 1960)³⁸. Now it is generally accepted as a point of junction between lateral 1/3rd and medial 2/3rd of a line drawn from umbilicus to right anterior superior iliac spine. These points suppose to correspond to the base of appendix.

Sir Z .cope (1959)³⁹ remarks that tenderness over the McBurney's point is not always constant. The pain he says seems to be actually located in the appendix itself and therefore depends on the position of the appendix and is obtainable when the viscus is not adhering to any surrounding part. Further the tenderness may be due to irritation of the

adjacent peritoneum. Gentle percussion can also elicit this point of maximum tenderness according to Z.cope³⁹ over the region. It may lie in the flank also.

RIGIDITY IN THE RIGHT ILIAC FOSSA:

With the passage of time, accurate localization become more difficult as muscular rigidity becomes evident in addition to the tenderness. This is due to the irritation of parietal peritoneum.

OBSTRUCTIVE APPENDICITIS:

The sequence of clinical events occurs much more quickly. The onset is abrupt and there may be severe generalized abdominal colic from the start. Temperature may be normal, vomiting is common so that the clinical picture may mimic acute intestinal obstruction. Once recognized urgent surgical intervention is required because it rapidly progresses to perforation. In both types attack can commence at any time, but frequently it does so in the early hours of the morning ,awakening the patient from the sleep. Pain, anorexia ,nausea, vomiting and fever as classical syndrome in not complete in some cases and in certain cases the only relevant features is pain or tenderness in the right iliac fossa.

SPECIAL FEATURES

1. Cutaneous hyperanaesthesia:

Presence of hyperanaesthesia in Sherrrens triangle (this is formed by lines joining the umbilicus, right anterior superior iliac spine and pubic symphysis) is a good in the diagnosis of gangrenous appendicitis . This is elicited by simply scratching the abdominal wall with the finger.

2. Rebound tenderness:

The suspected area is palpated with each expiration. The hand is now withdrawn suddenly as a result of this abrupt removal the abdominal musculature springs back into its original position. The patients will immediately cry or at least wince the pain. This is because the inflamed parietal peritoneum due to underlying inflamed organ also springs back along with abdominal musculature

3. Rovsings sign:

If the left iliac fossa is pressed pain is appreciated on the right iliac fossa in case of acute appendicitis. This is due to shifting of the coils or ileum to the right and pressing on the inflamed appendix

4. Signs of auscultation:

Activity of intestine may continue normally even in quite advance case of acute inflammation, eventually paralytic ileus supervenes and it is indicative of generalized peritonitis. Sometimes due to obstruction at the terminal ileum, exaggerated bowel sounds may be heard which confuses the surgeon to arrive at definitive diagnosis. Finally there is silent abdomen with long history of pain severe toxemia and abdominal with long history of pain severe toxemia and abdominal distention.

STANDARD TECHNIQUE & DIFFERENT TECHNIQUES FOR APPENDICECTOMY

A. ELECTIVE APPENDICECTOMY:-

Removal of appendix between attacks the so called of interval operation will be described first , since it is usually a simple procedure and a relatively standardized technique employed.

INCISIONS:-

1. GRIDIRON INCISION:-

This muscle splinting muscle incision is commonly used for appendicectomy the main advantage of this incision is that it does not damage any nerve & being muscle splinting it heals quickly. Inadvertently the sub costal nerve may be injured giving rise to inguinal hernias but this is very rare.

The incision an oblique one perpendicular to the right spino-umbilical line (which extends from the right anterior superior iliac spine to the umbilicus) through the Mc Burney's point that is junction between lateral 3rd & medial 2/3rd of 3 to 4 inches in length, whose 1/3rd will be above the spinoumbilical line and 2/3rd below the same line. Though this is the classical position of Mc Burney's grid iron incision, yet the surgeon

should to try to feel the caecum first before planning the position of the incision, as sometime the caecum with appendix may lie higher up or even sub hepatic. The skin, fascia of Camper and fascia of Scarpa are incised along the line of the incision. The fibers of the external oblique aponeurosis will be seen running along the line of the incision. They are simply split. If the incision made higher up or a little 3 laterally, one will be able to see the fleshy fibers of the muscle. The two margins of the divided aponeurosis are retracted. The muscle fibers of the internal oblique will be seen running perpendicular to the line of the incision. These fibers and the muscle fiber of the transverse abdominis are more or less running in the same direction and should be split by inserting the tip of the artery forceps & then opening it by the handle of the scalpel. The fingers are then introduced & the muscle fibers are more retracted .The fingers are replaced by right angle retractors to expose the transversalis and the peritoneum. This is picked up by two artery forceps as one layer and incised to enter the abdomen.

Technique :-

The caecum may present as soon as the peritoneum has been opened ,or it may be have to be sought for by two fingers introduced into the peritoneal cavity and passed backwards round the lateral wall. It is easily distinguishable from small bowel by the presence of taenia coli.

The caecum is grasped in a moist pack by the left hand and is gently withdrawn towards its lower end, when the appendix should follow it in the wound. Delivery of appendix is assisted if necessary by right index finger, which is introduced deeply into the lower part of the wound below the caecum. If the appendix cannot be readily found the operator should trace one of the taenia coli of the caecum leading to its base. The appendix is then freed by a finger passed along it towards its tip, any firm adhesions being gently disrupted. If dense adhesions are present then these should be separated or divided under the guidance of eye, and with the assistance of narrow bladed retractors. Sometimes as a result of previous inflammation the appendix is sharply kinked and is bound down by adventitious bands to the right iliac fossa or to the brim of the pelvis. Such bands can be divided with safety and without risk of causing haemorrhage if the knife is kept to the lateral side of appendix.

The part of the caecum to which the appendix is attached is retained outside the wound, while the remainder is returned to the peritoneal cavity. The appendix is raised up and is held by a pair of Babcock's forceps applied near its tip. The mesoappendix is clamped with one or more pairs of artery forceps and is divided and ligatured. A forceps is momentarily applied to the base of the appendix exactly at the point of its junction with the caecum and a ligature is tied around the

crushed area. It assists in the subsequent control of the stump if the ends of these ligature is kept long are retained in forceps. A purse string Lambert suture is inserted in the caecal wall around the base of the appendix. Forceps are then applied to the appendix 5 or 6mm distal to the ligature, the intervening lumen having been emptied by the pressure of the blades. A swab is placed underneath to absorb any escaping contents and the appendix is divided close to the forceps, the stump is invaginated with the slender forceps while the purse string suture is tightened. The appendix together with the knife, swab and forceps which have been contaminated by contact with the mucosa and placed in a bowl are removed from the field of operation.

Before the abdomen is closed the ligatured mesoappendix is reexamined for bleeding. The parts within reach are inspected or palpated particular attention being paid to the lower coils of the ileum and the ileocaecal lymph glands. In the females the uterus, right ovary and tubes are palpated by two fingers passed towards into the pelvis, the operation is completed by suture of the wounds in layers.

RETROGRADE REMOVAL OF APPENDIX:-

Frequently the base of the appendix is more accessible than the tip. This is especially likely to occur when the appendix occupies the retrocaecal position when its inflamed distal end may be adherent to the posterior wall of the caecum or may even be buried within the serous port. In such cases the retrograde method of removal may often simplify the operation. Two pairs of artery forceps are insinuated through the mesoappendix and applied to the base of the appendix 5-6 mm apart. The proximal forceps is removed and the appendix is ligatured in the groove that has been crushed. It is then divided close to the distal forceps and the proximal stump is invaginated. The appendix with its cut end still occluded by the forceps is now freed by careful dissection and by successive clamping and clipping of its mesentery from base to tip it is removed.

2. LANZ'S TRANSVERSE INCISION:-

This incision is made at a level of 2-3cm below the umbilicus and is centered on the midclavicular to midinguinal line. The structures incised are in the direction of the skin incision. This incision lies in the direction of skin wrinkle lines and is a better cosmetic incision the only disadvantage is that the rectal sheath is opened at the mid end of the wound.

3. PARAMEDIAN INCISION:-

Its chief advantage lies in the strong scar which results the incision is made parallel to the mid line a distance of 2-3cm from it. The anterior rectus sheath is divided in line incision. Forceps are placed on the medial cut margins, which are retracted to expose the medial edge of the rectus muscle. The rectus is then displaced laterally to expose the posterior sheath. The posterior sheath is incised together with the transversalis fascia and peritoneum.

Technique:-

The caecum may present as soon as the peritoneum has been opened or it may have to be sought for by two fingers introduced in to the peritoneal cavity and passed backwards round the lateral wall. A finger is inserted in to the wound to aid delivery of the appendix. The caecum is held by a moist pack in the left hand. The appendix is freed of any firmly adhesions. The appendix is held by a pair of Babcock's forceps applied near the tip. The mesentery is clamped with one or more pairs of artery forceps, and is divided & ligatured. The appendix is crushed near its junction with the caecum by a hemostat, which is removed & reapplied just distal to the crushed portion. A chromic catgut ligature is tied around the suture is inserted in to the caecum 1.2cm from the base. It is left un tied until the appendix has been amputated with a scalpel below the

hemostat. The sump is invaginated, while purse string suture is tied, thus burying the appendix stump.

4. RUTHERFORD MORRISON'S INCISION:-

It is useful if the appendix is para or retrocaecal and fixed. It is essentially an oblique muscle cutting incision with its lower end over Mc Burney's point & extending obliquely upwards & laterally as necessary.

5. BATTLES'S PARA RECTAL INCISION:-

This incision is mostly made on the lower abdomen over the lateral part of the rectus muscle. The skin & subcutaneous tissue are incised along the line of the incision the anterior rectus sheath is also divided in the same line. The rectus muscle is retracted medially to expose the posterior rectus sheath in the upper part of the incision and fascia transversalis in the lower major part of the incision, where the posterior rectus sheath is below the arcuate line. These nerves should be retracted to get into the abdomen.

But it may be so happen that sacrifice of one or two nerves may be necessary this will cause some weakness of that segment of the rectus muscle supplied by the nerve.

This incision was previously used for appendicectomy and for unilateral gynecological operations. But its popularity is on the wane as

neither it gives proper access to the organs concerned nor it can be extended due to the presence of intercostals nerve.

Closure is carried out in the same manner as that of the paramedian incision.

Shifting window technique:-

In 1993 Feb-March ASI conference at Hubli a paper was presented on shifting window technique for appendectomy.

In this technique paraumbilical incision was taken & was shifted to the McBurney's point and appendectomy was performed by the conventional method.

6. LATERAL TRANSVERSE COSMETIC INCISION OPEN APPENDICECTOMY^{25,40,41,42}

Small transverse incision 2.5 to 3 cm long in the right lower abdomen starting just on the lateral border of rectus muscle and extended laterally in the line of Mc Burney's point. The only muscle in the operation field is rectus that was retracted medially. No other muscle was cut/splitted. Better cosmesis and almost invisible scar is the hallmark of small incision appendectomy.that In our study the incision was small and without much muscle/nerve muscle and extended transversally towards Mc Burney's point (2.5-3 cm). Anterior sheath cut in line of the skin

incision and rectus muscle retracted with the help of long pronged Skin/Czerni's/Langenbuch's retractors. Peritoneum approached, is picked up with the haemostats and cut in the line of skin incision. Once abdominal cavity is approached retractors are removed and subsequently it requires little effort and manipulation to trace the appendix.. Rest of the procedure of appendectomy is done as per the standard protocol. Peritoneum is not closed and the retracted muscle comes to centre once the anterior sheath is sutured with chromic catgut. Skin is closed either with interrupted silk or subcuticular prolene. No special retractors are required for the procedure.

7. LAPAROSCOPIC APPENDICECTOMY⁴³

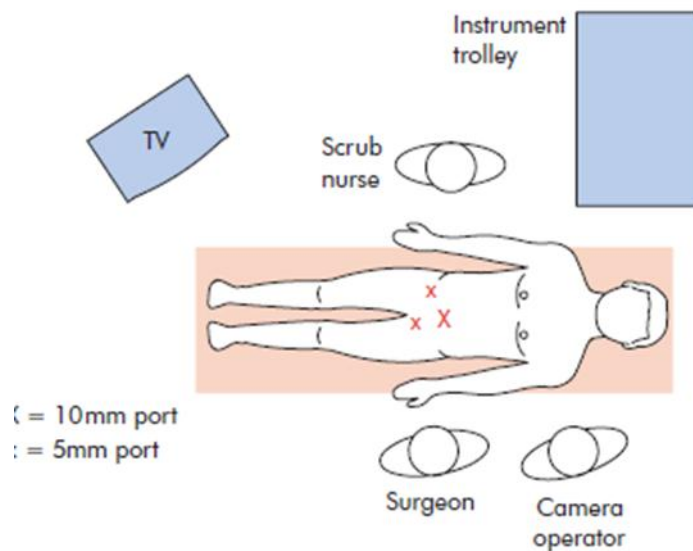
The most valuable aspect of laparoscopic in the management of suspected appendicitis is as a diagnostic tool particularly in women of child-bearing age.

Essential Requirement for Laparoscopic appendicectomy:-

Instruments for visualization:

- i) Light source
- ii) Telescope
- iii) Video camera system
- iv) Beam splitter

- v) Monitor
- vi) Video recorder
- vii) Video printer
- viii) Instruments for exposure & manipulation
- ix) Insufflator
- x) Puncture instruments
- xi) Grasping & dissecting instruments
- xii) Occlusion & ligation instruments
- xiii) Electro surgical unit. Laser equipment is unnecessary
- xiv) Irrigation & suction instruments
- xv) Wound closure instruments



Position of surgeon, assistants and equipment for laparoscopic appendectomy from Bailey and love's text book of surgery 25th edition page no-1214

Preparation of the patient for laparoscopic appendicectomy:-

Under the circumstances it is mandatory that the patient be totally prepared mentally and physically for the procedure. The steps of the laparoscopic procedure are explained to the patient. It is at all the times impressed that patients safety and the necessity of carrying out a complete & a through procedure may be terminated at any phase converted into a open surgery it is made clear that open surgery if require would be done during the same anesthesia. Specific informed consent must be taken. A fully informed patients confidence acceptance & cooperation & vital for the smooth conduct of the procedure.

The preoperative evaluation of the patient is identical to that for open appendicectomy. As every case is done under general anesthesia the routine evaluation of the patient for fitness for anesthesia is carried out.

The pneumoperitoneum:

The most important single step in the safe an efficient conduct of any laparoscopic procedure be it diagnostic or operative is the creation of a adequate generalized pneumoperitoneum. The pneumoperitoneum created with help of a spring loaded verses needle. A sub incision is made in the infraumbilical region. The versus needle is held like a dart between the thumb and the index finger, with the little finger placed on the

abdomen wall to act as a guard to prevent too deep or sudden penetration. The left hand elevates the abdominal wall as high as possible and with the gentle progressive pressure exerted by dorsiflexing the wrist the tip of the versus needle is advanced through the various layers of the abdominal wall.

The fact that the needle tip is in the free peritoneal cavity has to establish carefully.

This is done by;

1. Injecting saline
2. Hanging drop test
3. Free movement of the needle tip
4. Once it is established that the needle tip is in the free peritoneal cavity, it is concerned with the electronic pneumoinsufflator and carbondioxide insufflations is commenced at a flow rate of one liter per minute. These pressure readings on the insufflatiors at the tip of the needle and in the intraabdominal cavity are carefully monitored.
5. Percussions of the abdominal wall gives a resonant note & obliteration of liver dullness.

Next 4 trocars introduced into the peritoneal cavity using suitable incision on the abdominal wall.

Stapling techniques in laparoscopic appendicectomy:-

An automatic stapling device, the multifire endo-gia30, is an instrument, which can be passed through 12mm trocar sleeve, compresses the appendix as well as the resting stump, occluding its lumen with 3 lines of titanium staples and cutting between them. Using this stapler, the mean operation time is 35-95 min with no complications or mortality.

This new stapling device offers a simple and safe method for use in laparoscopic appendectomy.

MANAGEMENT OF APPENDIX MASS²⁶

If an appendix mass is present and the condition of the patient is satisfactory, the standard treatment is conservative Ochsner- Sherren regimen. This strategy is based on the premises that the inflammatory process is already localized & that inadvertent surgery is difficult and may be dangerous. It may be impossible to find the appendix & occasionally, a fecal fistula may form for these reasons it is wise to observe a non-operative programme but to be prepared to operate should clinical deterioration occur that is rising pulse rate increasing or spreading abdominal pain or increase in the size of the mass.

Careful record of the patients conditions and the extent of the mass should be made and the abdomen regularly reexamined. It is helpful to mark the limits of the mass on the abdominal wall using the skin pencil. A contrast enhanced CT examination of the abdomen should be performed and antibiotic therapy instigated. An abscess if present should be drained radio logically. Temperature & pulse rate should be recorded. 4th hourly and a fluid balance record maintained. Clinical deterioration is evidence of peritonitis is indication for early laparotomy. Clinical improvement is usually evident within 24-48hrs. Failure of the mass to resolve should rise suspicion of carcinoma or Crohns disease. Using this regimen approximately 90% of the cases resolve without incident. It is advisable to remove the appendix after an interval 6-8 weeks.

POST OPEATIVE COMPLICATIONS ⁴⁴

Post-operative complication following appendicectomy are relatively uncommon & reflects the degree of peritonitis that was present at the time of operation & intercurrent diseases that may predispose to complications.

- i) Wound infection
- ii) Intra abdominal abscess

- iii) Paralytic ileus
- iv) Respiratory complications
- v) Venous thrombosis & embolism
- vi) Portal pyaemia
- vii) Faecal fistula
- viii) Adhesive intestinal obstruction
- ix) Right inguinal hernia

PROGNOSIS:-

Early diagnosis as the general recognition of the necessity of early operation, improved anaesthesia, improved surgery, improved management of general peritonitis and newer antibiotics, all have added toward better prognosis in these days. Mortality is negligible in cases which are operated within 48 hrs after appearing of symptoms. Peltokallio and Tykka⁴⁵ (1981) reported 0.12% in non perforated & 0.18% in perforated group.

The morbidity & mortality rate for masses is the lowest if treated conservatively but high if early operation is done (Mcpherson & Kinmonth)⁴⁶.

MATERIALS &
METHODS

MATERIAL AND METHODS

Source of data

All patients in B.L.D.E.U.'s Hospital admitted or came to Surgery OPD in whom diagnosis of appendicitis was made.

Method of collection of data

- All patients in B.L.D.E.U.'s Hospital admitted or came to Surgery O.P.D., from Oct. 2010 to May 2012, in whom diagnosis of appendicitis was made, were alternatively allocated into the study and laparoscopy group, after taking informed consent.
- Patients underwent necessary investigations.
- Patients in Group A underwent appendicectomy via lateral transverse incision (about 2cm transverse cosmetic incision made over the right iliac fossa centering the McBurney's point).
- Those belonging to Group B underwent laparoscopic appendicectomy.

Inclusion criteria

All patients attending the Surgical OPD or admitted in Surgery ward in whom the diagnosis of appendicitis is made.

Exclusion criteria

- Patients with complicated appendicitis.
- Patients who do not give consent to be included in the study.
- Patients who are obese i.e. B.M.I. > 30.

RESEARCH HYPOTHESIS:

Lateral transverse incision appendectomy is more cost effective and of shorter duration as compared to laparoscopic appendectomy.

SAMPLING:

The study period was from Oct. 2010 to May 2012.

The prevalence of appendicitis in cases of acute abdomen is 57.6%⁹.

Allowable error was considered as 20%.

Using the formula

$$n = [(1.96)^2 \times p \times (1-p)] / L^2$$

The sample size calculated to be, n = 70, in each group.

The following tests were used to calculate the results:-

1. Mean & S.D.
2. Diagrammatic representations
3. Z test for difference between two proportions.
4. Z test for difference between two means.

Investigations or interventions that were conducted on the patients:

- a. Complete blood count.
- b. Urine – sugar, albumin and microscopy.
- c. Random blood sugar, serum creatinine.
- d. Electro-cardio-gram and Chest X-ray (when age of patient is >35yrs, or if necessary).
- e. Ultrasonography abdomen.
- f. Histopathology of resected specimen.

OBSERVATIONS & RESULTS

OBSERVATION AND RESULTS

During the study period, i.e. from October 2010 to May 2012, a total of 140 patients underwent appendicectomy in our hospital. Out of these, alternatively patients were allotted to study i.e LTCI group (70 patients) and laparoscopy groups (70 patients).

In this study, primarily the duration of surgery, cost of surgery and the duration of post-operative stay was analyzed in both groups. However, during the study, observations were also made regarding the age and sex distribution of the patients.

Following are the observations made during this study shown in both tabular and graphical form:

AGE DISTRIBUTION:

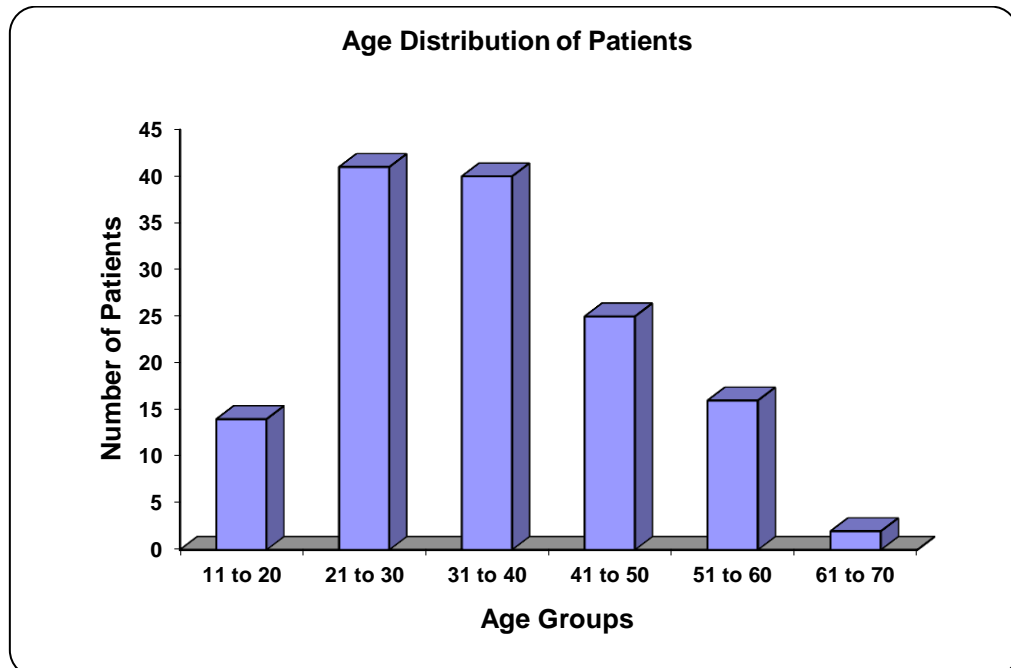
In this study, the age of patients ranged from 14 to 62 years. About 75.72% of the patients were in the age group of 21-50 years and about 10% to 12% below and above it, as shown below.

Table 1

Age distribution

Age	Number	Percentage
11-20	14	10.00
21-30	41	29.29
31-40	40	28.57
41-50	25	17.86
51-60	16	11.43
61-70	2	1.43

Chart 1



SEX DISTRIBUTION

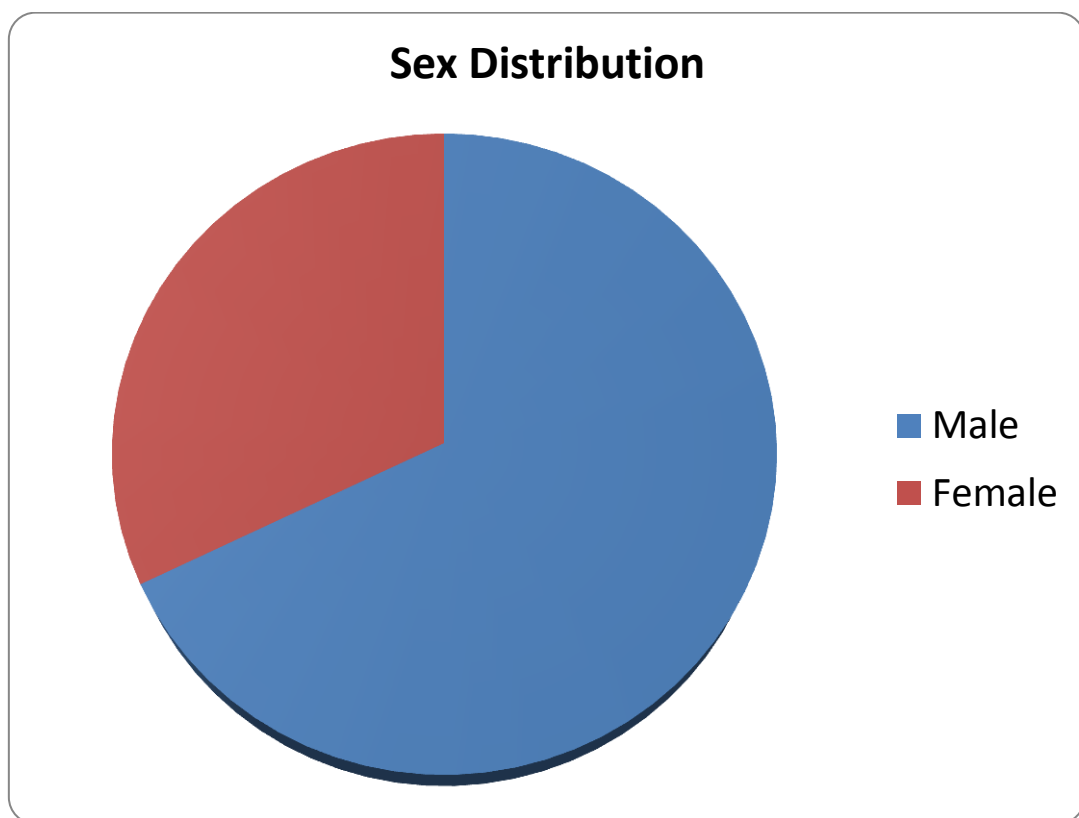
About two-third of the patients were male in this study.

Male:female ratio was about 2:1, as shown in the following table:

Table 2
Sex Distribution

	Number	Percentage
Male	95	67.86
Female	45	32.14

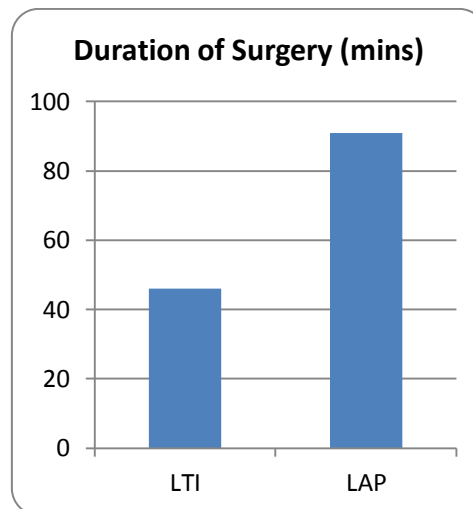
Chart 2



DURATION OF SURGERY

The average duration of surgery was significantly longer for laparoscopic appendicectomy as compared to the study group (91 mins vs. 46 min, $p < 0.0001$), as shown in the graph below.

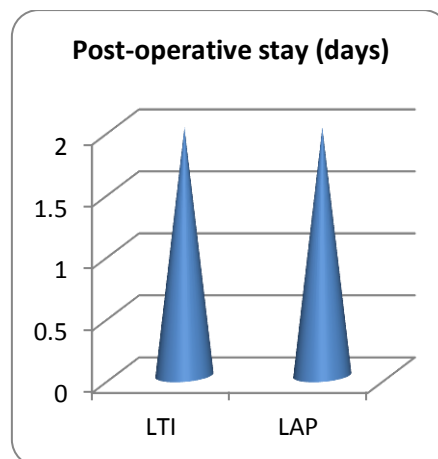
Chart 3



POST-OPERATIVE STAY

Post-operative stay was almost same in both groups, of about 2 days.

Chart 4



COST OF SURGERY

Laparoscopic appendicectomy was significantly costlier than lateral transverse cosmetic incision appendicectomy (Rs. 4482 vs. Rs. 3331), when cost was calculated using same medicines for both the groups. The difference was mainly due to the higher cost of general anesthesia required for laparoscopic appendicectomy and the higher operative charges for laparoscopic appendicectomy.

Chart 5

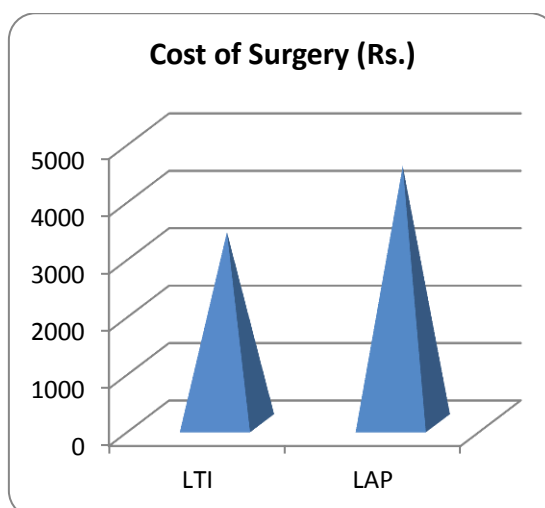


Table 3

Comparison of Lap vs. LTI

	LAP	LTI	Z value	P value
Postop stay (day)	2 ± 0.75	2 ± 0.68	0.00	0.5
Duration of surgery (min)	91 ± 17.75	46 ± 18.65	11.99	<0.0001
Cost of Surgery (Rs.)	4482 ± 610.58	3331 ± 438.88	10.65	<0.0001

ANALYSIS &
DISCUSSION

ANALYSIS AND DISCUSSION

AGE AND SEX DISTRIBUTION:

In this study majority of patients were males (male:female ratio was 2:1) with 67.86 of patients being males and 32.14 being females. This was comparable to the study done by Malik AA, Wani RA, Saima BD, Wani AA.²⁴

In our study 75% patients were in the age group 21-50 years which is comparable to the observation made by Das MK, Roy H in their study.²³

DURATION OF SURGERY:

Laparoscopic appendicectomy consumed longer duration compared to LTCI in our study. The average time duration of laparoscopic vs. LTCI being 91 minutes vs. 46 minutes respectively with a p value of <0.0001 which is highly significant. This is comparable with study done by Sanjay Shahin, Satyendra Dhar.²⁵

POST OPERATIVE STAY (DAYS):

Post-operative stay is comparable in patients undergoing LTCI and laparoscopic procedure i.e. 2 ± 0.75 and 2 ± 0.68 days.

COST OF SURGERY:

Cost of surgery is significantly reduced in LTCI compared to laparoscopic procedure with values being Rs. 3331 ± 438 vs. Rs. 4482 ± 610 respectively which is comparable to study done by Sanjay Shashin, Satyendra Dhar.²⁵

SUMMARY

SUMMARY

This study was conducted from October 2010 to May 2012, where a total of 140 patients underwent appendicectomy in our hospital. 70 patients among them underwent LTCI and other 70 underwent laparoscopic appendicectomy. They were allotted alternatively to LTCI and laparoscopy group.

The two groups were compared in terms of total surgery duration, post-operative stay and cost of surgery.

IN OUR STUDY:

- Male:female ratio was 2:1
- Majority of patients belong to the group of 21-50 years of age (75.72%)
- Post-operative stay in LTCI is 2 ± 0.68 days vs. 2 ± 0.75 days in laparoscopy group which are comparable.
- Duration of surgery in minutes in LTCI group is 46 ± 18.65 vs. 91 ± 17.75 minutes in laparoscopic group and p-value ≤ 0.0001 which is highly significant.
- Cost of surgery is Rs.3331 \pm 438 in LTCI vs. Rs.4482 \pm 610.58 in laparoscopic group with p-value < 0.0001 which is highly significant.

CONCLUSION

CONCLUSION

Enthusiasm among surgical fraternity for minimally invasive surgery has almost made the aphorism. **“The Bigger the Surgeon, the Bigger the incision”** lose its essence. However in a set-up where laparoscopic setting is not available, this lateral transverse incision appendicectomy is as effective as laparoscopic appendicectomy. In our study lateral transverse cosmetic incision technique is safe, cosmetically much better without mortality and negligible morbidity.

Furthermore, LTCI enables less hospital stay, less need for analgesics, less need for skilled personnel, early return to the routine, less surgery duration and less cost of surgery compared to laparoscopic surgery.

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BIBLIOGRAPHY

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ANNEXURE I

INFORMED

CONSENT

ANNEXURE I

INFORMED CONSENT FORM

B.L.D.E.A.U.'s SHRI B.M. PATIL MEDICAL COLLEGE HOSPITAL
AND RESEARCH CENTER, BIJAPUR – 586103, KARNATAKA

TITLE OF THE PROJECT—

**A COMPARATIVE STUDY OF
LATERALISED TRANSVERSE
COSMETIC INCISION
APPENDICECTOMY AND
LAPAROSCOPIC
APPENDICECTOMY.**

PRINCIPAL INVESTIGATOR—

**Dr. B.P. Kattimani,
M.S General Surgery,
Prof. of General Surgery**

P.G STUDENT—

**Dr. Dayanand Biradar,
Dept. of General Surgery**

Purpose of research:-

I have been explained about the reason for doing this study and selecting means a subject for this study. To have also been given free choice for either being included or not in the study.

This study is to evaluate whether lateral transverse incision appendicectomy is more cost effective and of shorter duration as compared to laparoscopic appendicectomy.

Procedure:-

I have been explained that depending upon the group allocated to me, I'll either undergo lateral transverse incision

appendicectomy or laparoscopic appendicectomy; and that before hand I'll be subjected to certain routine blood and urine investigations and chest x-ray and USG Abdomen, if needed.

Risks and discomforts:-

I understand that I may experience some pain or discomfort while examination or during my treatment. This is mainly the result of my condition and the procedure of this study is not expected to exaggerate these feelings that are associated with the usual course of treatment. I understand that analgesic will be given to me depending on the need.

Benefits:-

I understand that my participation in the study will have no direct benefit to me other than potential benefit of treatment. The major potential benefit is to find out that whether lateral transverse incision appendicectomy is more cost effective and of shorter duration as compared to laparoscopic appendicectomy.

Confidentiality:-

I understand that the medical information produced by this study will become a part of hospital records and will be subject to confidentiality. Information of sensitive personal nature will not be part of medical record, but will be stored in the investigation research file.

If the data are used for publication in the medical literature or for teaching purpose no name will be used and other identifications such as photographs will be only with special written permission. I understand that I may see the photograph before giving permission.

Request for more information:

I understand that I may ask more questions about the study at any time, Dr. Dayanand Biradar at the department of surgery is available to answer my questions or concerns. I understand that I will be informed of any significant new findings discovered during the course of the study, which might influence my continued participation. A copy of this consent form will be given to me to keep for careful reading.

Refusal for withdrawal of participation:

I understand that my participation is voluntary and that I may refuse to participate or may withdraw consent and discontinue participation in the study at any time without prejudice. I also understand that Dr. Dayanand Biradar may terminate my participation in the study after he has explained the reasons for doing so.

Injury statement:

I understand that in the unlikely event of injury to me resulting directly from my participation in this study, if such injury were reported promptly, the appropriate treatment would be available to me. But, no further compensation would be provided by the hospital. I understand that

ANNEXURE II

CASE

PERFORMA

ANNEXURE – II

SCHEME OF CASE TAKING

- | | |
|-----------------------------------|--|
| 1) Name: | CASE NO: |
| 2) Age: | IP NO: |
| 3) Sex: | DOA: |
| 4) Religion: | DOS: |
| 5) Occupation: | DOD: |
| 6) Residence: | |
| 7) CHIEF COMPLAINTS: | |
| 8) HISTORY OF PRESENTING ILLNESS: | |
| 9) PAST HISTORY: | |
| | <ul style="list-style-type: none">• Diabetes mellitus• Hypertension• History of any drug intake• Renal disease• Jaundice |
| 10) FAMILY HISTORY: | |

11) GENERAL PHYSICAL EXAMINATION:

Pallor:	present/absent
Icterus:	present/absent
Clubbing:	present/absent
Generalized Lymphadenopathy:	present/absent
Build:	Poor/Middle /Well
Nourishment:	Poor / Middle / Well

12) VITALS

PR:

BP:

RR:

Temp:

Weight:

13) OTHER SYSTEMIC EXAMINATION:

- Per Abdomen examination
- Respiratory System
- Cardiovascular System
- Central Nervous System
-

14) INVESTIGATION:

BLOOD: Hb

URINE: Albumin

TC

Sugar

DC

Microscopy

ESR

BT, CT

BLOOD UREA, SERUM CREATININE

RBS

USG Abdomen

16) FINAL DIAGNOSIS:

17) POST-OPERATIVE FOLLOW UP:

		PRE-OP	POD-1	POD-2	POD-3	POD-4	POD-5
PULSE RATE							
BLOOD PRESS.							
TEMPERATURE							
RESP. SYSTEM							
C.V.S.							
P/A -							
NAUSEA / VOMITING							
FLATUS / STOOLS							
INCISION SITE	LEAK						
	DEHISCENCE						
	INFECTION						
COST OF SURGERY							

ANNEXURE III

COLOUR

PLATES

ANNEXURE III

COLOUR PLATES



Photo 1: The Incision

Photo 2: Stretching the incision to deliver out the appendix.

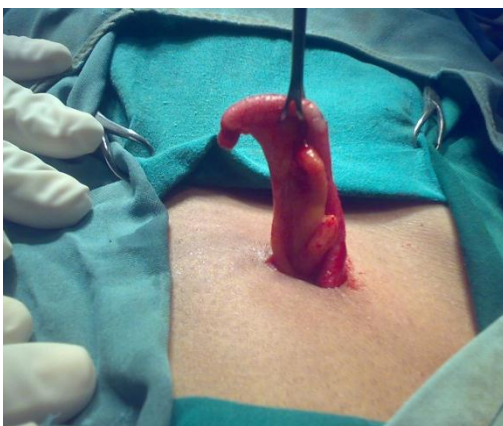


Photo 3: Appendix delivered out.



Photo 4: Meso-appendix ligated and divided.

Photo 5: Incision closed with cyanoacrylate gel.



Photo 6: Incision sutured by single stitch.

Photo 7: Lateral transverse cosmetic incision scar after 6 weeks.



Photo 8: Laparoscopic appendicectomy scar after 6 weeks.

ANNEXURE IV

KEY TO

MASTER

CHART &

MASTER

CHART

ANNEXURE IV

KEY TO MASTER CHART

STAY **Postoperative Hospital Stay**

TSD **Total Surgery Duration**

LAP **Laparoscopic Appendicetomy**

LTCI **Lateral Transverse Cutaneous Incision**

MASTER CHART

SI NO	NAME	AGE	SEX	IP NO	PT CODE	DOA	DOD	PROCEDURE	STAY	TSD	COST
1	MALLAPPA	45	M	17947	B01	28/08/2011	30/8/2011	LAP	2	90	4200
2	KAMALAPPA	25	M	18001	B02	28/8/2011	09/01/2011	LAP	1	94	4100
3	KANTAPPA	45	M	17998	A01	28/08/2011	30/08/2011	LTCI	1	60	3400
4	VENKAPPA	35	M	13419	A02	07/02/2011	07/06/2011	LTCI	2	64	3300
5	YAMUNAPPA	60	M	18000	B03	28/8/2011	30/8/2011	LAP	1	100	4200
6	BASAPPA	29	M	15603	A03	30/07/2011	08/02/2011	LTCI	2	45	3200
7	SITA	38	F	21793	A04	25/10/2011	30/10/2011	LTCI	3	60	3200
8	SRIKANT	14	M	13417	B04	07/03/2011	07/05/2011	LAP	1	90	4400
9	SHARANAPPA	45	M	16246	B05	08/06/2011	08/10/2011	LAP	1	98	4400
10	BHIMRAI	55	M	23318	AO5	12/01/2010	12/04/2010	LTCI	2	60	3000
11	MANJULA	34	F	21787	A06	25/10/2010	29/10/2010	LTCI	2	75	3200
12	VEERESH	30	M	16245	B06	08/07/2011	08/08/2011	LAP	1	90	4500
13	KALMAT	45	M	17998	B07	23/8/2011	26/8/2011	LAP	1	90	4700
14	DHEEPA	41	F	4682	B8	26/2/2011	29/2/2012	LAP	4	114	5480
15	MADIVALAPPA	18	M	2554	B09	20/02/2011	24/02/2011	LAP	3	75	5000
16	SUSHILA	35	F	2428	B10	02/06/2011	02/10/2011	LAP	3	75	4900
17	VIMALA	35	F	13419	B11	07/03/2011	07/05/2011	LAP	1	90	4800
18	SHANKRAPPA	39	M	27219	B12	12/06/2010	12/11/2010	LAP	3	94	5900
19	VAMITI	50	M	13421	B13	07/02/2011	07/05/2011	LAP	1	100	4300
20	HUCHAPPA	38	M	12849	A07	25/6/2011	29/6/2011	LTCI	3	60	3500
21	YALLAPPA	52	M	11732	A08	06/11/2011	17/06/2011	LTCI	4	70	3800
22	PRAKASH	40	M	11731	A09	13/06/2011	16/06/2011	LTCI	3	66	3500
23	HANUMANTAPPA	55	M	11730	A10	06/07/2011	06/10/2011	LTCI	2	40	3300
24	SHANKRAPPA	40	M	15665	A111	30/7/2011	08/02/2011	LTCI	1	50	3200
25	RAMESH	35	M	13415	B14	07/03/2011	07/06/2011	LAP	2	90	3200
26	SANAGOND	48	M	27221	B15	12/05/2010	12/08/2010	LAP	2	150	5000
27	YAMUNAVVA	29	F	15661	A12	30/07/2011	08/04/2011	LTCI	2	45	3500
28	AMOGADEV	54	M	14026	A13	17/07/2011	19/07/2011	LTCI	1	45	3300
29	BASAPPA	29	M	24572	A14	30/10/2010	11/03/2010	LTCI	1	45	3200
30	SHANTAPPA	50	M	9130	B16	28/5/2011	29/5/2011	LAP	1	90	3400
31	SUGANDI	30	F	24577	A15	30/10/2010	11/03/2010	LTCI	2	70	3300
32	LAXMI	45	F	6646	A16	14/04/2011	17/04/2011	LTCI	2	64	3200
33	YAMUNAPPA	60	M	18002	A17	28/8/2011	30/8/2011	LTCI	1	80	3400
34	PARVATI	45	F	27382	B17	12/06/2010	12/11/2010	LAP	3	120	4200
35	SHANTAPPA	30	M	10699	B18	05/01/2011	05/04/2011	LAP	3	110	5000
36	SONU	30	F	4939	B19	03/01/2012	03/02/2012	LAP	1	90	3900
37	RAJU	30	M	28560	B20	24/12/2011	27/12/2011	LAP	3	100	5200
38	GEETA	18	F	5053	B21	30/5/2011	06/01/2011	LAP	2	100	4700
39	AMBANNA	18	M	26778	A18	21/11/2011	24/11/2011	LTCI	3	60	3400
40	RAJU	22	M	1412	A19	17/2/2011	18/2/2011	LTCI	1	20	2800

41	RAMU	20	M	8203	A20	21/7/2011	24/7/2011	LTCI	2	40	3000
42	BHAGIRATI	26	F	5560	A21	30/5/2011	05/03/2011	LTCI	4	60	3900
43	SHANTVEER	23	M	4563	A22	03/12/2011	14/3/2011	LTCI	2	35	2800
45	DIPA	41	F	4682	A23	03/12/2011	14/3/2011	LTCI	2	20	5000
46	VIJAYALAXMI	28	F	27275	A24	25/12/2011	28/12/2011	LTCI	2	40	2000
47	LALSAB	62	M	11734	A25	06/11/2011	14/6/2011	LTCI	1	45	2900
48	SOUMYA	40	F	14032	A26	16/7/2011	20/7/2011	LTCI	2	70	3300
49	KAMALABAI	35	F	24574	B22	11/01/2011	11/04/2011	LAP	3	100	4900
50	BHIMSHANKAR	20	M	14038	B23	07/09/2011	07/12/2011	LAP	1	110	4700
51	BASU	30	M	28566	B24	01/02/2011	01/06/2011	LAP	1	120	5800
52	VEERESH	38	M	16245	B25	08/06/2011	08/10/2011	LAP	2	90	4700
53	KAMALAWWA	25	F	16241	B26	08/07/2011	08/09/2011	LAP	1	80	4800
54	SURESH	35	M	25334	B27	13/11/2011	18/11/2011	LAP	2	70	4100
55	SOUMYA	40	F	14073	A26	16/7/2011	20/7/2011	LTCI	2	70	3300
56	HANUMAPPA	55	M	11733	A27	06/12/2011	15/6/2011	LTCI	2	30	3600
57	DEVDAAS	35	M	12880	A28	24/6/2011	28/6/2011	LTCI	1	30	3900
58	MALAPPA	32	M	27271	A29	12/12/2011	13/12/2011	LTCI	1	30	2800
59	YAMUNAVVA	29	F	15601	A30	31/7/2011	2/7/2011	LTCI	2	60	3900
60	SHANKRAPPA	40	M	15665	B28	30/7/2011	07/01/2011	LAP	1	120	5000
61	LAKSHMAN	20	M	26774	B29	11/11/2011	11/12/2011	LAP	1	100	3300
62	SHANTHA	30	F	16919	B30	11/10/2011	11/12/2011	LAP	1	90	4400
63	PANDU	22	M	27134	B31	11/10/2011	11/11/2011	LAP	1	120	4100
64	SUNTHA	28	F	4526	B32	02/02/2011	02/04/2011	LAP	2	90	4200
65	PRABHATHA	36	F	27291	B33	11/04/2011	11/06/2011	LAP	2	90	4700
66	BHORAMA	33	F	15607	A31	07/05/2011	11/06/2011	LTCI	1	40	3000
67	SHARAPPA	45	M	16246	A32	11/10/2011	11/12/2011	LTCI	2	80	3300
68	MUDAKAPPA	35	M	16763	A33	11/11/2011	13-11-2011	LTCI	2	70	3700
69	YALARLING	19	M	9119	A34	03/05/2011	03/07/2011	LTCI	2	45	3500
70	DHUNDAPPA	35	M	12880	A35	10/04/2011	10/06/2011	LTCI	2	60	3400
71	SHANTHAPPA	30	M	10699	B34	08/08/2011	08/11/2011	LAP	3	123	5600
72	RAMAPPA	60	M	6139	B35	05/05/2011	05/07/2011	LAP	2	110	5200
73	SHANTHAPPA	23	M	11198	B36	23/10/2011	26/10/2011	LAP	3	90	5500
74	AMOGSHIDAPPA	55	M	14026	B37	22/11/2011	24/11/2011	LAP	2	88	4700
75	VAMSHI	50	M	13421	B38	10/11/2011	10/12/2011	LAP	1	90	5000
76	SHIDAPPA	30	M	20629	A36	17/11/2011	19/11/2011	LTCI	2	50	3400
77	PRABHU	30	M	19482	A37	09/10/2011	09/12/2011	LTCI	2	40	3400
78	YAMUNAPPA	52	M	11732	A38	04/01/2011	04/04/2011	LTCI	3	30	2300
79	PRAKASH	40	M	11731	A39	07/01/2011	07/02/2011	LTCI	1	20	3200
80	GANAPATHI	49	M	5042	A40	2/2/2011	02/04/2011	LTCI	2	30	3200
81	SHRIKANTH	35	M	13417	B39	19/10/2011	20/10/2011	LAP	1	90	4900
82	RAMESHA	42	M	13415	B40	19/10/2011	20/10/2011	LAP	1	70	4800
83	GANGAMA	50	F	26778	B41	28/12/2011	30/12/2011	LAP	2	80	5200
84	SHANTHAPPA	30	M	10699	B42	08/08/2011	08/09/2011	LAP	1	90	4400
85	HARSHA	38	M	12089	A41	10/01/2011	10/03/2011	LTCI	2	20	2800
86	HANUMANTH	55	M	11730	A42	23/10/2011	25/10/2011	LTCI	2	40	3000

87	RAMU	22	M	8903	A43	13/5/2011	14/5/2011	LTCI	1	40	3300
88	SHANGAMMA	18	M	10701	A44	15/8/2011	17/8/2011	LTCI	2	30	3200
89	SHANJU	23	M	1198	A45	01/01/2011	01/02/2011	LTCI	1	38	2900
90	GANGAMMA	40	F	9125	A46	29/4/2011	05/01/2011	LTCI	2	45	3900
91	BASAPPA	32	M	10697	A47	19/9/2011	21/9/2011	LTCI	2	45	3000
92	YAMUNAPPA	29	M	9118	A48	08/03/2011	08/05/2011	LTCI	2	60	3200
93	MAHESH	34	M	23349	A49	11/08/2011	11/09/2011	LTCI	2	40	3400
94	KASTURIBAI	28	F	23343	A50	11/06/2011	11/08/2011	LTCI	1	20	2900
95	REKHA	20	F	23345	A51	11/05/2011	11/09/2011	LTCI	2	60	3900
96	SHTAMALA	34	F	23341	A52	11/07/2011	11/09/2011	LTCI	2	70	4000
97	MARUTI	30	M	24447	B43	19/11/2011	23/11/2011	LAP	2	90	4900
98	KALYANI	28	F	24450	B44	20/11/2011	22/11/2011	LAP	1	88	4000
99	MALLAVVA	32	F	24446	B45	20/11/2011	23/11/2011	LAP	2	100	4300
100	PRASD	40	M	25604	B46	12/04/2011	12/06/2011	LAP	1	70	3900
101	CHANDRASHEKAR	36	M	25616	B47	12/04/2011	12/07/2011	LAP	2	80	3900
102	RAMESHA	28	M	25613	B48	12/03/2011	12/06/2011	LAP	1	90	4000
103	MAHADEVI	30	F	25621	A53	12/04/2011	12/07/2011	LTCI	2	20	3600
104	PANDU	22	M	26194	B49	12/11/2011	14/12/2011	LAP	2	80	4200
105	SURESH	36	M	26191	B50	12/11/2011	13/12/2011	LAP	1	80	4100
106	GANGAVA	50	F	26778	A54	18/12/2011	21/12/2011	LTCI	2	40	3800
107	LAXMAN	20	M	26774	B51	18/12/2011	21/12/2011	LAP	2	90	4700
108	VIJAYALAXMI	28	F	27275	A55	25/12/2011	27/12/2011	LTCI	1	40	3900
109	MALLAPA	32	M	27271	A56	26/12/2011	28/12/2011	LTCI	2	20	3600
110	SHRIDAR	23	M	27877	B52	11/01/2012	11/04/2012	LAP	2	90	5000
111	SUNIL	31	M	2259	A57	29/11/2012	12/01/2012	LTCI	1	40	3300
112	PRAKASH60	60	M	2794	A58	02/05/2012	02/08/2012	LTCI	2	20	3000
113	SUNITA	28	F	4526	A59	27/02/2012	28/02/2012	LTCI	1	20	3200
114	SONU	30	M	4939	B53	03/01/2012	03/01/2012	LAP	1	90	4000
115	GEETA	18	F	5053	B54	03/05/2012	03/07/2012	LAP	2	80	4400
116	KRISNAPPA	42	M	4518	B55	03/11/2012	13/03/2012	LAP	1	90	3900
117	BIRAPPA	42	M	6116	A60	18/03/2012	21/03/2012	LTCI	2	45	3800
118	RAMABAI	40	F	2855	B56	14/02/2012	17/02/2012	LAP	2	70	5000
119	SANGAPPA	48	M	2774	B57	02/06/2012	02/08/2012	LAP	2	90	4400
120	PREMA	42	F	12697	A61	06/10/2012	13/06/2012	LTCI	2	20	3200
121	MALAPPA	18	M	13189	B61	17/06/2012	20/06/2012	LAP	2	40	3200
122	KALAVATI	55	F	13178	B62	17/06/2012	19/06/2012	LAP	1	90	4000
123	SHIVANAND	35	M	13182	B63	17/06/2012	20/06/2012	LAP	2	80	4200
124	BHIMANAGOUDA	50	M	12706	A62	06/10/2012	13/06/2012	LTCI	2	20	3800
125	SAVITA	38	F	12704	A63	06/02/2012	06/06/2012	LAP	2	88	5000
126	SHIVANAND	14	M	12213	B64	06/02/2012	06/05/2012	LTCI	1	90	4000
127	VIJAYALAXMI	51	F	1214	A64	06/02/2012	06/05/2012	LAP	1	40	3000
128	MANISH	30	M	12150	A65	06/04/2012	06/05/2012	LTCI	1	20	3000
129	VANAMALA	55	F	12145	A66	06/04/2012	06/06/2012	LTCI	2	50	3200
130	MALLAMMA	24	F	11615	B65	26/05/2012	30/05/2012	LAP	2	120	5000
131	KALLAPPA	47	M	11626	B66	26/05/2012	29/05/2012	LAP	1	86	4000

132	KALMESH	42	M	11625	B67	28/05/2012	29/05/2012	LAP	1	80	3900
133	PEERA	62	M	11624	B68	28/05/2012	30/05/2012	LAP	2	60	3900
134	HYDERALI	29	M	11047	B69	20/05/2012	23/05/2012	LAP	2	65	4400
135	MALLAPPA	48	M	11028	A67	20/05/2012	22/05/2012	LTCI	1	20	2800
136	BASAPPA	32	M	10478	A68	05/12/2012	16/05/2012	LTCI	2	60	3000
137	NAGARAJ	40	M	10481	B70	05/12/2012	16/05/2012	LAP	2	90	4000
138	SIDDAPPA	56	M	10477	A69	14/05/2012	16/05/2012	LTCI	2	35	3100
140	RAJESHWARI	30	F	9847	A70	6//5/2012	05/08/2012	LTCI	1	80	3900