



NEGATIVE APPENDECTOMY; FREQUENCY AT A TEACHING HOSPITAL

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ABSTRACT... Acute appendicitis is the most common surgical emergency. Despite advances in diagnostic techniques, an accurate pre-operative diagnosis may still pose a challenge to the clinicians. Therefore, even today we are facing a high rate of negative appendectomy. The current study explores this aspect of a common and important disease. **Objectives:** To know the percentage of negative operative findings in acute appendicitis in our hospital that drains wide area of population from lower socioeconomic strata. **Patients and methods:** This prospective cross-sectional study was conducted at Department of Surgery, Lady Reading Hospital, Peshawar within two years from 1-1-2009 to 31-12-2010. This study included 673 cases undergoing appendectomy. All the patients operated for clinical diagnosis of acute appendicitis over the study period were included. Their history, clinical features, and results of investigations were noted. Gross examination of intact appendix specimen, and on-table cross sectional inspection of appendix was made; and were correlated with histopathological findings (as gold standard). **Results:** The study included 673 patients. There were 478 males (70%), and highest number of patients was in second decade of life. On gross examination, 545 (81%) appendices were swollen, 531 (79%) were reddened due to inflammation; 63 (9.4%) were gangrenous; and 50 (7.5%) had perforated; while in 128 patients (19%) the appendix was normal looking with shiny surface. Fibrino-purulent exudate in the peri-appendiceal region was noticed in 253 (37.6%) patients. The cut section of appendix showed wall abscess in 474 (70.4%) cases, and mucosal ulceration in 325 (48.2%). Necrotic foci in mucosa were seen in 188 (27.6%) cases, and in 61 cases (9%) the necrosis was extending through the wall up to serosa. Histopathology revealed marked acute inflammation in 416 (61.8%) cases, moderate inflammation in 92 (13.7%), and mild inflammation in 47 (6.9%); while in 118 cases the appendix had no evidence of inflammation (giving negative appendectomy rate of 17.5%). Negative appendectomy rate in females was 29.2% compared to 12.7% in males. Probable alternate diagnoses are also addressed. **Conclusions:** The negative appendectomy can be avoided in many cases if ultrasound facilities were available during odd hours of patient presentation. Similarly, the rate of negative appendectomy can be further reduced in adults, especially females around puberty and reproductive age, by the provision of laparoscopy during emergency hours of the day.

Key words: Appendicitis; Appendectomy; Acute disease. Acute abdomen; Abdominal pain; Negative appendectomy

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INTRODUCTION

Acute appendicitis is probably the most common surgical emergency with an incidence of 1.5 and 1.9/1000 in male and female population, respectively¹. It is one of the most common intra-abdominal infections seen in surgical departments². In a local study, out of 3,181 patients that presented in the emergency with abdominal pain, 432 had acute appendicitis, giving a 13.6% prevalence³. It is estimated that approximately 6% of the world population will suffer from acute

appendicitis during their life time⁴. Appendectomy for acute appendicitis is an effective, universally accepted procedure performed more than 300,000 times annually in the United States⁵. The diagnosis of acute appendicitis is mostly made on clinical grounds, but sometimes it can present with unusual symptoms. Decision making in acute appendicitis may be difficult due to the generous overlap of clinical manifestation with other clinical syndromes resulting in diagnostic delay⁴. With improvement in diagnostic techniques, the

efficiency of diagnosis has increased over the years. However, decision making in equivocal cases of acute appendicitis poses a clinical challenge, especially in developing countries where advanced radiological investigations are not widely used, and do not appear cost effective⁶.

Very few features are helpful in diagnosing appendicitis; including history of shifting of pain, right lower quadrant tenderness and rebound tenderness, and muscle guarding. A structured and complete medical history and detailed physical examination focusing on these few symptoms, a careful interpretation of investigations can improve diagnostic accuracy. One cannot rely on any single investigation, but a combination of such investigations along with thorough physical examination is essential for accurate diagnosis of acute appendicitis⁷. All diagnostic tests are adjunctive to the clinician. Ultrasound of abdomen and pelvis should be the first step in the care of patients with right lower abdominal pain after the physical examination,⁸ as it can significantly improve the diagnostic accuracy in patients with equivocal clinical features of appendicitis⁹. Patients who were not imaged during workup for suspected appendicitis had more than 3 times the odds of negative appendectomy as those who were imaged¹⁰. The diagnostic difficulties lead surgeons to unnecessary explorations, especially in young females¹¹. The entity of negative appendectomy still poses a dilemma because it is associated with certain risks and unnecessary costs to both patients and the institutions¹². The rate of negative appendectomy has been reported to range from 6.9% to 31%;¹³⁻¹⁶ especially in young females^{17,18}. In a Lahore based study, the incidence of negative appendectomy was 11%, and all these patients were females¹⁹.

A high diagnostic accuracy is required in patients suspected of having acute appendicitis, as negative appendectomy carries significant morbidity from associated complications including wound sepsis, infertility from fimbrial damage, and greater risk of iatrogenic abdominal adhesions after laparotomy for healthy appendix compared with that for acute

appendicitis. Besides, a negative appendectomy during pregnancy is not free of risk to the fetus²⁰.

PATIENTS AND METHODS

This descriptive included 673 patients undergoing appendectomy and conducted at the Department of General Surgery at the Lady Reading Hospital Peshawar, a tertiary care hospital that serves low income urban and rural population between two years (2009-2010). All patients undergoing surgery for pre-operative diagnosis of acute appendicitis were included. Those patients operated for interval appendectomy, and those undergoing incidental appendectomy were excluded from the study. All patients undergoing appendectomy for acute appendicitis were included in the study. They were admitted in the surgical wards through emergency or outdoor clinics. A thorough history was obtained from all the patients with detailed clinical examination, and routine baseline investigations were performed. Ultrasound abdomen and pelvis was performed in selected cases. CT scan was not used in any case. The criteria for the diagnosis of acute appendicitis was migratory right iliac fossa pain, presence of nausea or single episode of vomiting, anorexia, tenderness and rebound tenderness in the right iliac fossa, raised total leukocyte count (more than 11,000/mm³), and no abnormalities on urine routine examination and KUB x-rays. During exploration, physical appearance of appendix was noted. This included observation of intact specimen for swelling, redness, normal shiny appearance or otherwise, gangrene, perforation; and presence of fibrinopurulent exudates. The gross cross sectional appearance of appendix was then noted for presence of abscess formation within the wall, mucosal ulcerations, and foci of necrosis. All appendices were submitted for histopathology, and this was taken as the 'Gold standard'. All the data so collected was entered to a structured proforma. All the data were analyzed by the SPSS (version 15.0) for frequency distribution like mode and percentage. Results are presented in tabulated or graphic forms, as relevant.

RESULTS

The study is based on data collected from 673 patients that underwent appendectomy over the study period, including 478 males (70%) and 195 females (30%). Mean age was 21.7±9.2 years; and the age range was 13-71 years. Highest number of patients were in second decade of life (n=290, 43.1%) followed by the third decade of life (n=236, 35.1%) [Fig. 1].

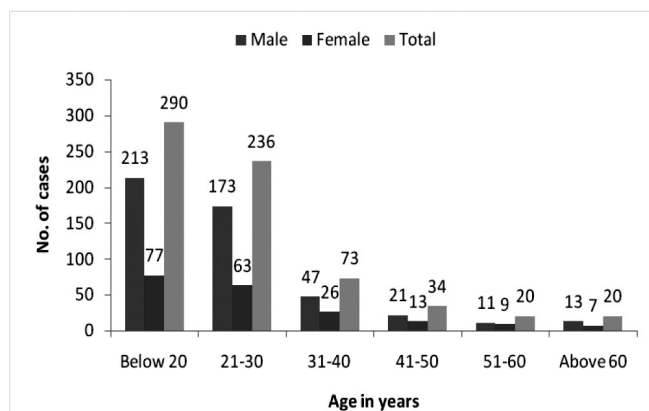


Fig-1. Age and gender distribution

Abdominal pain was complained by all the patients. In 451 patients (67%) the pain started in some part of the abdomen and then shifted to the right lower quadrant of abdomen, while in remaining cases it started in right lower quadrant and stayed there (table-I). Nausea and/or single

episode of vomiting was present in 538 patients (80%) and anorexia in 633 cases (94%). Mild to moderate fever (less than 101°C) was noted in 229 cases (34%). Tenderness in the right iliac fossa (RIF) was present in 666 patients (99%), while rebound tenderness was observed in 572 patients (85%) [Table I].

Feature	No. of cases	Percentage
Symptoms		
Pain started in RIF	222	33.0
Pain shifted to RIF	451	67.0
Anorexia	633	94.0%
Nausea / vomiting	538	80.0%
Fever up to 101°C	229	34.0%
Signs		
Tenderness in RIF	666	99.0%
Rebound tenderness RIF	572	85.0%

Table-I. Clinical data (n=673)

Total leukocyte count (TLC) was obtained in all the cases. It was raised above 11,000/mm³ in 252 patients (37.5%); 55 patients (8.2%) had TLC below 6000/mm³; 236 (35.0%) had TLC ranging 6000-9000/mm³; while 130 patients (19.3%) had TLC ranging 9000-11,000/mm³. It was observed that majority of the patients with normal appendix had TLC below 11,000/mm³ (table-II). On routine examination of urine only 148 patients (22%) had significant pus cells and red blood cells (Table II).

Parameters	No. of cases	Percentage	Normal appendix (n=118)
Total leukocyte count			
Below 6000/mm ³	55	8.2	13
6001-9000/mm ³	236	35.0	67
9001-11000/mm ³	130	11.3	23
Above 11000/mm ³	252	37.5	15
Urine microscopy			
Pus cells/RBC's in urine	148	22.0	

Table-II. Investigations (n=673)

Gross inspection of appendix during surgery revealed it to be diffusely swollen in 545 cases (81.0%); reddened due to inflammation in 531 (79.0%); gangrenous in 63 (9.4%); and perforated in 50 cases (7.5%); while in 128 cases (19.0%) the appendix had normal shiny appearance. Fibrino-purulent exudates was found in 253 cases (37.6%) (table-III). The appendix was transected

on table for further inspection. It showed abscess formation within the wall 474 cases (70.4%); mucosal ulcerations 325 cases (48.2%); focal necrosis in the mucosa in 188 cases (27.6%); and greenish black gangrenous necrosis through wall extending to the mucosa in 61 cases (9.0%) [Table III].

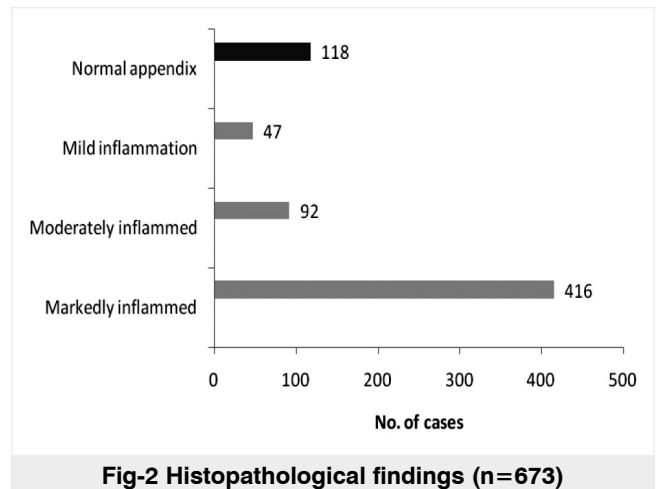
	No. of cases*	Percentage
Inspection of intact appendix specimen		
Swollen	545	81.0
Reddened due to inflammation	531	79.0
Gangrene	63	9.4
Perforation	50	7.5
Normal looking	128	19.0
Findings on cross section of appendix		
Abscess in the wall	474	70.4
Mucosal ulceration	325	48.2
Foci of mucosal necrosis	188	27.6
Necrosis extending to serosa	61	9.0

Table-III. Naked eye examination of appendix (n=673)

**Some cases are counted twice due to multiple findings*

The histopathology of appendix specimens showed marked inflammation in 416 cases (61.8%) and moderate inflammation in 92 cases (13.7%); while in 118 cases the appendix was normal (17.5%) [Fig. 2].

Out of 118 patients with normal appendix removed, 57 patients were females and other 61 were male. While the overall negative appendectomy rate was 17.5%; it was significantly higher among females (Table IV).



Gender	Total cases	Cases with normal appendix	%age
Females	195	57	29.2
Males	478	61	12.7
Total	673	118	17.5

Table-IV. Frequency of negative appendectomy

A retrospective search was made for probable alternate diagnosis in those with negative appendectomy. Commonest was the urinary tract infection; while no cause could be identified in 35 cases (Table V).

	No. of cases	Male (n=61)	Female (n=57)
Urinary tract infection	27	10	17
Mesenteric lymphadenitis	22	13	9
Worm infestation small gut	6	4	2
Non-specific terminal ileitis	5	3	2
Right ureteric calculus	3	3	-
Ovarian cyst	13	-	13
Mid-cyclic pain	7	-	7
No cause found	35	28	7
Total	118	61	57

Table-V. Alternate pathology in cases with normal appendix (n=118)

DISCUSSION

Negative appendectomy remains a major concern for the surgeon, for appendicitis has been considered a surgical disease. It is defined as absence of inflammation and absence of intramural neutrophils on histopathology²¹. With negative appendectomy rates ranging as high as 44%,²² efforts to minimize the number of non-

therapeutic appendectomies are justified. The management of appendicitis has evolved from the era of open surgery with a negative appendectomy rate ranging from 20 to 30%²³. Clinical judgment is the most important factor in the management of patients with suspected acute appendicitis⁷. In spite of the advances in the diagnostic and imaging techniques, the rates of negative findings

on appendectomy have not decreased much²⁴. It has been observed that a policy of selective usage of diagnostic adjuncts only in equivocal cases of appendicitis does not significantly reduce the negative appendectomy rate²³. Appendectomy may not be necessary for the majority of patients with acute uncomplicated appendicitis, as many patients resolve spontaneously and others may be treatable with antibiotics alone⁵. However, if we maintain a strict policy of operating only on clinically proven cases of acute appendicitis many deserving cases will be missed and may land elsewhere with complications like mass formation, perforation, and peritonitis, with significant increase in morbidity. On the other hand, if the criteria for operating on these cases is somewhat relaxed, many cases with normal appendices will undergo unnecessary surgery. Therefore, the operating policies should be preferably balanced to avoid unwanted surgeries. Here comes the role of various scoring systems for evaluation of acute appendicitis. Hussain and allies reported on efficacy of Alvarado score in their study; the negative appendectomy rate was 14.3% while the accuracy of clinical diagnosis was 93%²². The Alvarado score is simple and ideal for supporting the diagnosis of acute appendicitis. Particularly the junior staff may benefit from the use of structured data form by adopting a more systemic approach to patient assessment^{25,26}. However, it is not meant to replace clinical judgment and is not considered a primary mean of making a diagnosis of acute appendicitis²⁷.

We have observed an overall negative appendectomy rate of 17.5%; it was 12.7% in males and 29.2% in females. Chavda SK reported similar figures; a negative appendectomy rate of 13% for males and 30% for females²⁸. Many studies have reported significantly fewer negative appendectomies in males compared with females^{18,29}. Mirza and colleagues from Karachi have identified different factors for a negative appendectomy in their patients. These include a non-teaching hospital setup where diagnostic scoring system was difficult to apply; female gender; selective use of imaging modalities; other pathologies presenting with pain in right lower

quadrant and requiring surgical intervention; and non-availability of CT scan and laparoscopy at the time of need³⁰. In the current series, only 37.5% (n=252) cases had leukocyte count higher than 11,000/mm³ (the normal limit). Tariq Latif et al also found that WBC count was raised only in 50% of the patients with proven acute appendicitis³¹. The raised WBC count is an essential component of Alvarado scoring, but it is not diagnostic.

In a study on preliminary diagnostic laparoscopy for acute appendicitis, Dickenson AJ et al have stressed on its significance especially in females where rate of negative appendectomy is high³². Although physical examination remains crucial, CT has become the primary modality dictating care of patients with presumed appendicitis³³. Helical CT can be useful as a diagnostic tool in evaluating patients with acute appendicitis. Rao et al showed that mandatory CT of every patient being evaluated for possible appendicitis can reduce overall utilization of hospital resources, and result in a 3% negative appendectomy rate³⁴. Schuler et al also demonstrated a lower negative appendectomy rate in the patients who were evaluated by CT³⁵. Same was reported by Webb et al that the negative appendectomy rate was lower for adult patients who underwent preoperative CT, compared with patients who did not undergo preoperative imaging³⁶. In the equivocal clinical presentation of appendicitis as defined by Alvarado scores of 4 to 6, adjunctive CT is recommended to confirm the diagnosis in the emergency department setting³⁷. Selective use of CT is associated with a reduction in unnecessary laparotomy rate in patients in whom the diagnosis of appendicitis is in question after a thorough clinical evaluation. Jones K reported his results in 389 cases undergoing appendectomy. He observed progressive fall in the rate of negative appendectomy with increasing use of CT scan in evaluation of appendicitis³⁸. Some authors recommend routine use of ultrasonography/computed tomography for diagnosis of acute appendicitis³⁹. Corso demonstrated that 22% of apparently normal appendices at laparoscopy were, in fact, acutely inflamed on histopathology⁴⁰. Naked eye assessment of the appendix alone

could be misleading, as was observed by Grunewald; he was wrong in 11 out of 43 cases (26%)⁴¹.

SUMMARY

Despite all deficiencies, negative appendectomy rate in our hospital is no more than that of developed countries, and the good thing is that it can be improved even further. A substantial number of patients with negative appendectomy were later diagnosed to have urinary tract infection, mesenteric lymphadenitis, and other non-surgical pathologies. Surgery in them could have been avoided if ultrasound facilities were available during odd hours of patient presentation. Similarly, the rate of negative appendectomy can be further reduced in adults, especially females around puberty and reproductive age, by the provision of laparoscopy during emergency hours of the day. The heavy load of patients in tertiary care hospitals demands upgrading of district specialist facilities so that only referred patients could be entertained in the tertiary care centers. This will decrease the work load and will improve the system. If one is encountered with a clinically suspected acute appendicitis and a normal looking appendix on exploration, it is better to perform the appendectomy.

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REFERENCES

1. Malik KA, Khan A, Waheed I. **Evaluation of the Alvarado score in diagnosis of acute appendicitis.** J Coll Phys Surg Pak 2000;10:392-4.
2. Bhopal FG, Ahmed BSH, Ahmed M. **Role of TLC and C-reactive protein in the diagnosis of acute appendicitis.** J Surg Pak 2003;8(2):14-7.
3. Bilal MK, Asim I, Khalid S. **Frequency of Acute Appendicitis in Patients Presenting with Acute Abdomen in Emergency Department - One Year Experience.** J Rawal Med Coll 1999;3(1-2):35-6.
4. Iqbal M. **Appendicitis: a diagnostic dilemma.** Rawal Med J 2005;30(2):51-2.
5. Mason RJ. **Surgery for appendicitis: is it necessary?** Surg Infect (Larchmt). 2008 Aug;9(4):481-8.
6. Jawaid A, Asad A, Motiei A, Munir A, Bhutto E, Choudry H, Idrees K, Durrani K, Rahman M, Ahuja M, Nawab Q, Ahmed R, Ali S, Aslam S, Abbasi S, Feerasta S, Alam S, Ahmed U, Jehan I. **Clinical scoring system: a valuable tool for decision making in cases of acute appendicitis.** J Pak Med Assoc 1999;49(10):254-9.
7. Jehangir SK, Hassan H, Khan JA. **Investigations for Acute Appendicitis: Can we rely on them?** Pak J Surg 2002;18(2):27-30.
8. Sezer TO, Gulece B, Zalluhoglu N, Gorgun M, Dogan S. **Diagnostic value of ultrasonography in appendicitis.** Adv Clin Exp Med. 2012;21(5):633-6.
9. Afzal M, Sarfraz A, Javed M, Rafi M, Jawed SMA. **Ultrasonography can improve diagnostic accuracy in equivocal cases of Appendicitis.** Biomedica 1997;13(1):46-50.
10. Drake FT, Florence MG, Johnson MG, Jurkovich GJ, Kwon S, Schmidt Z, Thirby RC, Flum DR; SCOAP Collaborative. **Progress in the diagnosis of appendicitis: a report from Washington State's Surgical Care and Outcomes Assessment Program.** Ann Surg. 2012;256(4):586-94.
11. Weed IQ, Khalid MD. **Surgical Audit of Acute Appendicitis.** Proceeding Shaikh Zayed Postgrad Med Inst Jun 2000;14(1):7-12.
12. Seetahal SA, Bolorunduro OB, Sookdeo TC, Oyetunji TA, Greene WR, Frederick W, Cornwell EE 3rd, Chang DC, Siram SM. **Negative appendectomy: a 10-year review of a nationally representative sample.** Am J Surg. 2011;201(4):433-7.
13. Nadeem MA, Asim K, Khalid MG, Imran A, Tariq M, Abdul Majeed Ch. **Appendectomy: A Contemporary Appraisal.** Ann King Edward Med Uni 1999;5(2):184-7.
14. Ma KW, Chia NH, Yeung HW, Cheung MT. **If not appendicitis, then what else can it be? A retrospective review of 1492 appendectomies.** Hong Kong Med J. 2010;16(1):12-7.
15. Nisar A, Sadiq M, Jehangir B, Hadi G. **Correlation of clinical and histological diagnosis of acute Appendicitis.** J Postgrad Med Inst 2003;17(2):254-7.
16. Park JS, Jeong JH, Lee JI, Lee JH, Park JK, Moon HJ. **Accuracies of diagnostic methods for acute appendicitis.** Am Surg. 2013;79(1):101-6.
17. Cheema AM, Akif M, Zahid M. **A Study of Controversial Diagnosis of Recurrent Appendicitis.** Biomedica 2001;17:41-3.
18. Chandrasegaram MD, Rothwell LA, An EI, Miller RJ. **Pathologies of the appendix: a 10-year review of 4670 appendicectomy specimens.** ANZ J Surg. 2012;82(11):844-7.

19. Ahmad N, Abid KJ, Khan AZ. **Acute appendicitis - incidence of negative appendectomies.** Ann K E Med Coll 2002; 8(1):32-4.
20. Ito K, Ito H, Whang EE, Tavakkolizadeh A. **Appendectomy in pregnancy: evaluation of the risks of a negative appendectomy.** Am J Surg. 2012;203(2):145-50.
21. Mariadason JG, Wang WN, Wallack MK, Belmonte A, Matari H. **Negative appendectomy rate as a quality metric in the management of appendicitis: impact of computed tomography, Alvarado score and the definition of negative appendectomy.** Ann R Coll Surg Engl. 2012;94(6):395-401.
22. Hussain M, Kashif M, Ahmad S. **Acute Appendicitis in Children: Comparison of clinical diagnosis versus modified Alvarado score system.** Ann K E Med Coll. 2004;10:52-4.
23. Myers E, Kavanagh DO, Ghous H, Evoy D, McDermott EW. **The impact of evolving management strategies on negative appendectomy rate.** Colorectal Dis. 2010;12(8):817-21.
24. Güller U, Rosella L, McCall J, Brügger LE, Candinas D. **Negative appendectomy and perforation rates in patients undergoing laparoscopic surgery for suspected appendicitis.** Br J Surg. 2011;98(4):589-95.
25. Mustafa AG, Sohu KM, Ahmad E, Hamer W, S Asghar N. **Role of Alvarado Score in Diagnosis of Acute Appendicitis.** Pak J Surg 2001;17(3):41-6.
26. Sajid M Sh, Waqar A, Hanif M, Rehan AG, Ghafoor A. **Clinical Scoring in the Diagnosis of Acute Appendicitis.** J Rawal Med Coll 1999;3(1-2):32-4.
27. Shahzad A, Safdar HS, Masood R. **Appendectomy; modified Alvarado scoring system; does it help to avoid unwanted operation?** Professional Med J 2004;11(1):68-71.
28. Chavda SK, Hassan S, Magoha GA. **Appendicitis at Kenyatta National Hospital, Nairobi.** East Afr Med J. 2005; 82:526-30.
29. Ma KW, Chia NH, Yeung HW, Cheung MT. **If not appendicitis, then what else can it be? A retrospective review of 1492 appendectomies.** Hong Kong Med J. 2010;16(1):12-7.
30. Mirza MR, Habib L, Jaleel F. **Factors identified for negative appendectomies.** Mymensingh Med J. 2009;18(2):198-202.
31. Tariq L, Masood R. **The white blood cell count is not a criteria for the diagnosis of Acute Appendicitis.** Proceeding Shaikh Zayed Postgrad Med Inst 2002;16(1):37-9.
32. Dickenson AJ, Mackie IP, Peel AL. **Diagnostic laparoscopy for suspected appendicitis: only useful in young women.** Int J Surg Investig. 1999;1:343-6.
33. Nelson DW, Causey MW, Porta CR, McVay DP, Carnes AM, Johnson EK, Steele SR. **Examining the relevance of the physician's clinical assessment and the reliance on computed tomography in diagnosing acute appendicitis.** Am J Surg. 2013;205(4):452-6.
34. Rao PM, Rhea JT, Novelline RA. **Effect of computed tomography of the appendix on treatment of patients and use of hospital resources.** N Engl J Med 1998; 338:141-6.
35. Schuler JG, Shortsleeve MJ, Goldenson RS. **Is there a role for abdominal computed tomographic scans in appendicitis?** Arch Surg 1998;133:373-7.
36. Webb EM, Nguyen A, Wang ZJ, Stengel JW, Westphalen AC, Coakley FV. **The negative appendectomy rate: who benefits from preoperative CT?** Am J Roentgenol. 2011;197(4):861-6.
37. McKay R, Shepherd J. **The use of the clinical scoring system by Alvarado in the decision to perform computed tomography for acute appendicitis in the ED.** Am J Emerg Med. 2007;25(5):489-93.
38. Jones K, Pena AA, Dunn EL. **Are negative appendectomies still acceptable?** Am J Surg. 2004;188:748-54.
39. Park JS, Jeong JH, Lee JI, Lee JH, Park JK, Moon HJ. **Accuracies of diagnostic methods for acute appendicitis.** Am Surg. 2013;79(1):101-6.
40. Corso F. **Laparoscopic appendectomy.** Int Surg, 1994;79: 247-250.
41. Grunewald B., Keating J. **Should the normal appendix be removed at operation for appendicitis?** J R Coll Surg Edinb, 1993;38:158-160.



Thomas Addison (April 1793 - 29 June 1860)



Thomas Addison (April 1793 – 29 June 1860) was a renowned 19th-century English physician and scientist. He is traditionally regarded as one of the "great men" of Guy's Hospital in London. Among other pathologies he discovered Addison's disease and Addisonian anemia. He entered the University of Edinburgh Medical School in 1812 as a medical student. In 1815 he received the degree of Doctor of Medicine. He suffered from depression and on 29 June 1860, he committed suicide.



PREVIOUS RELATED STUDY

Tariq Wahab Khanzada, Abdul Samad, Waseem Memon. APPENECTOMY; COMPARISON BETWEEN LAPAROSCOPIC & OPEN METHOD (Original) Prof Med Jour 15(4) 425 - 430 Oct, Nov, Dec, 2008.

AUTHORSHIP AND CONTRIBUTION DECLARATION

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