Intussusception in Adults; Direct and Retrograde Types

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Abstract : Nine patients over 15 years of age admitted to the Chaoprayayommaraj Hospital,Suphanburi, in 6 years period from October 1985 to September 1991,in whom the diagnosis of intussusception was documented at laparotomy,were discovered and their records were retrospectively studied. The incidences of them were approximately 0.001 % of all types of patients, 0.01 % of general surgical patients, 6.6 % of all cases with gut obstruction who received surgical treatments, and 45 % of all intussusception in that 6 years period. Their age ranged from 29 to 82 years with a mean age of 55 years. There were 6 women and 3 men. More cases had chronic symptoms,and their symptoms and signs were not typical. Barium enema were done in 8 cases,demonstrated intussusception in 7 cases, and one case of retrograde colic intussusception. The other 8 cases had direct intussusception of which anatomic types were ileoileal (3 patients), ileocolic (1patient), cecocolic (1patient), and colic (3 patients). Resections of the involved intestinal segments with end to end anastomoses were made in all cases. All cases had leading causes which were benign tumors in 5 patients and malignant tumors in 3 patients. Summary of clinical,radiological and pathological findings of all cases are reported,and the literatures of intussusception in adults with emphasis on retrograde type are reviewed.

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INTRODUCTION

Intussusception is one of the most common surgical emergencies especially in infancy and early childhood. But in adults,intussusception accounts for 5% of all cases of intestinal obstruction[1] , and incidence of adult intussusception is low, about 5-16% of all intussusception[2,3,4].

The presenting clinical picture of adult intussusception is not typical[1] and symptoms are varied[2], so the diagnosis is hardly made preoperatively[1,5]. In additional to a high degree of suspicion, careful examination of plain radiographs of abdomen and barium study; represented by either barium enema or peroral examination (or gastrointestinal series) are helpful in diagnosing adult intussusception[1,3,6,7,8,9].

In contrast to childhood intussusception, which is idiopathic in 90% of cases[4], adult intussusception has a demonstrable cause in about 75-90% of cases[1,3,4,10,11], and 63%[4] to 70%[1,2,9] of all adult intussusception are tumor related. Operation is indicated more frequently in adults than in infants[1,2,3].

Retrograde or reverse intussusception which is the unusual type of intussusception, is infrequently seen and less often considered. The ratio of retrograde adult intussusception to all adult intussusception is 2:400(0.5%)[12], 6:1,000(0.6%)[13],

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3:154(1.9%)[14], 5%15, and 5:40(12.5%)[2] . One case of retrograde colic intussusception in adult was found in Chaoprayayommaraj Hospital, Suphanburi, and introduced my attention to review the cases and literatures of adult intussusception with emphasis on retrograde type.

MATERIALS & METHODS

Nine patients over 15 years of age admitted to the Chaoprayayommaraj Hospital, Suphanburi, in the 6 years period from October 1985 to September 1991, in whom the diagnosises of intussusceptions were documented at laparotomy, were searched from lists of of all operated patients and their records were retrospectively studied. Each record was reviewed for anthropometric data, history of patient, symptoms and signs, radiological examinations and findings, operative note, and pathological report. And all of their radiographs were also reviewed.

RESULTS

The 9 patients of adult intussusceptions were discovered in 751,149 patients of all types at Chaoprayayommaraj Hospital, Suphanburi, in 6 years period from October 1985 to September 1991, an incidence of 0.001%; and among 87,962 general surgical patients, an incidence of 0.01%. 20 cases of all intussusception documented at laparotomy were found, so the incidence in adults is 45%. Gut obstruction in 137 patients who were surgically treated in this 6 years period were caused by intussusception in adults approximately 6.6%. Their age ranged from 29 to 82 years with a mean age of 55 years. There were 6 women and 3 men in this series. (Table1)

Three patients presented with acute onset of symptoms within 3 days, and one patient presented within 2 weeks after onset of symptoms. But in 5 patients, symptoms were chronic, about 1 month in 4 cases and extending backwards to 6 monthes in one case. Three patients showed signs of partial or complete intestinal obstruction. Abdominal pain and mass were presented in 2 patients. Three patients had abdominal pain and vomiting. And signs of GI bleeding were found in 1 patient. (Table1)

In all patients, radiological examinations were performed,using only plain films of abdomen in one case, plain films and barium enema were taken in 7 cases, and in the rest one, plain films, long GI study, and barium enema were done. Definite diagnosis of intussusception were reached preoperatively by barium enema in 7 patients, of which one case (case 9) was retrograde colic intussusception causing partial obstruction at descending colon. (Fig.1) In 5 patients (case 4,5,6,7,8), barium enema revealed complete obstruction of barium flow with positive signs of direct intussusception. (Fig. 2-6) And in one case (case 2), barium enema showed normal study of large intestine, but on the post evacuation film, obstruction of barium reflux into terminal ileum was demonstrated with polypoid filling defect at barium head and(coiled spring) appearance, suggestive of polypoid mass with enteric intussusception. (Fig.7) The rest 2 cases who had post operative diagnosis of enteric intussusception had taken plain films and barium enema in one case (case 1) whose barium enema revealed negatived study of large intestine but plain films were suggestive of intestinal obstruction.

TABLE 1 Clinical summary of 9 cases of intussusception in adults with pathological findings

Case No.	Age(Y) /sex	Symptoms & Signs	Direction	Anatomic type	Surgical treatment	Leading cause *	Pathological findings
1	29/F	Abd.pain, N/V. 2d.	direct	ileoileal	ileal resection	P.P.M. 5X4 Cms. at ileum	Neurofibroma
2	59/F	colicky pain Lt.abd.,N/V. 2w.	direct	ileoileal	ileal resection	P.P.M. 5X3X4 Cms.at terminal ileum	Non-Hodgkin lymphoma
3	64/M	Abd.distension, pain, N/V., gut obstruction 3 d.	direct	ileoileal	Rt.hemi-colectomy	P.P.M. 3X2.5X2 Cms at ileum	Polyp of ileum, necrotic,benign
4	40/F	Abd.pain, N/V. 1m.	direct	ileocolic	Rt.hemi-colectomy	P.P.M. 5X5X4 Cms.at distal ileum	Large cell lymphoma with pericecal LN. 3/6
5	82/F	Adb.mass,pain 1m.	direct	cecocolic	Rt.hemi-colectomy	IM.M. 6X10X4 Cms. at cecum	Intramural lipoma of cecum
6	75/F	chr.intermittent lower GI.bleeding 1m.	direct	colocolic	T.colon resection	P.P.M. 6.5X4X3.5 Cms. at T.colon	Borderlined or in--determined smooth M.tumor (intraluminal)
7	54/M	chr.intestinal obstruction 1m.	direct	colocolic	T.colon resection	P.P.M. 4X5X3 Cms. at T.colon	Pedunculated submucous lipoma, ischemic colitis
8	32/F	Abd.mass,pain 6m.	direct	colocolic	Lt.hemi-colectomy	P.P.M. 8X10X6 Cms. at splenic F.	Signet ring cell carcinoma
9	63/M	chr.constipatⁿ with acute gut obstruction 2d.	retrograde	colocolic	partial D.and S. Colectomy	S.P.M. 1.5X1X5 Cms. at S.colon	Adenomatous polyp with intussusception &acute infarction

Note*:- P.P.M.= pedunculated polypoid mass, IM.M. = intramural mass, S.P.M. = sessile polypoid mass.

The another case (case 3) had taken only plain supine and upright films of obdomen which demonstrated definite signs of intestinal obstruction, suggested at small intestine,also. (Fig.8) These two cases had had progressive signs and symptoms of abdominal distension, pain and vomiting so they were explored laparotomy without further preoperative radiological investigation. The radiological findings of all patients are summarized in Table 2.

The direction of the intussusceptions in this series is isoperistalsis or direct type in 8 patients; and the unusual,reverse or retrograde colic type was found in one case. Anatomic types of the 8 direct intussusceptions are including of ileoileal orenteric (3 patients), ileocolic (1 patient), cecocolic (1 patient), and colocolic or colic (3 patients) intussusceptions. (Table 1)

In all cases, diagnosises of intussusceptions were documented by explore laparotomy and surgical treatments were Rt.hemicolectomy (3 patients), Lt.hemicolectomy (1 patient), descending and sigmoid colectomy (1 patient), transverse colectomy (2 patients), and ileal resection (1 patient); with end to end

anastomoses. (Table 1)

Leading causes of intussusceptions were identified in all cases. 7 cases had pedunculated polypoid masses, one had sessile polypoid mass, and another had intramural mass. All leading causes were tumors (Table 1) which are benign tumors in 5 patients,malignancy in 3 patients, and borderline or indetermined tumor in 1 patient.

TABLE 2 Radiological findings of 9 cases of intussusceptions in adults

Case No.	1	2	3	4	5	6	7	8	9	frequency of Y (%)
Intussusception was preop.diagnosed by radiological exam.	N	Y	N	Y	Y	Y	Y	Y	Y	78
Radiological gindings										
I. Plain films of abdomen:-										
1. Sausage-shaped,homogeneous soft tissue mass with gas outline apex	N	N	N	Y	Y	Y	Y	Y	Y	67
2. two straight or undulating peripheral air strips or air rings surrounding the mass	N	N	N	Y	Y	Y	N	Y	Y	56
3. narrow air filled lumen surrounded by a thick soft tissue cylinder of "doughtnut"sign(on end on view)	N	N	N	Y	N	N	N	Y	N	22
4. Bird's beak or cone shaped narrowing air filled gut which entered the area of intussusception	N	N	N	Y	N	N	N	N	N	11
5. tumor causing intussusception seen at head of the sausage mass	N	N	N	N	S	Y	N	Y	S	22
6. air fluid levels in the dilated bowel loops	Y	N	Y	N	Y	N	Y	N	Y	56
7. Scant or absence of colonic gas or fecal content	Y	N	Y	Y	Y	Y	N	N	N	56
II. Barium enema										
1. obstruction of barium flow suddenly	N	Y	-	Y	Y	Y	Y	Y	Y*	88
2. formation of cap liked,concave,or U shaped barium head	N	Y	-	Y	Y	Y	Y	Y	N*	75
3. barium filled central canal	N	N	-	N	N	Y	N	Y	Y	38
4. Concentric rings of barium or Coiled spring sign	N	Y	-	Y	Y	N	Y	Y	Y**	75
5. Smooth, granulated, or ulcerated surface of tumor at head of sausage which is well seen on postevacuation film	N	Y	-	Y	Y	Y	Y	Y	Y	88
6. Reduction or change in position of intussusceptum during taking barium enema : -paritally	N	N	-			N	N	Y	N	38
-nearly completely				Y						
-completely					Y					
7. Change in position on postevacuation film	N	N	-	Y	N	Y	N	Y	N	38
III. Long GI study or Peroral barium examination										
1. Transient delayed barium column	-	-	-	-	-	-	Y	-	-	-
2. Dilatation of proximal gut with bird's beak liked or cone shaped narrowing lumen which entered the area of intussusception	-	-	-	-	-	-	Y	-	-	-
3. Barium filled central canal	-	-	-	-	-	-	N	-	-	-
4. Coiled spring sign	-	-	-	-	-	-	N	-	-	-
5. High position of Rt.side colon	-	-	-	-	-	-	N	-	-	-

Note : -Y* = partial obstruction with bird's beak or cone shaped narrowing lumen at signoid colon.
-N* = no formation of capliked barium head at the point of obstruction,but there was reverse cupping filling defect at proximal end of the narrowing lumen just distal to splenic flexure.
- N = No, Y = Yes = had that sign,or positive. S = suspicious.
- Y** = Coiled spring sign was seen in retrograde or reverse fashion after the barium had flowed through the narrow central lumen bayond the apex of intussusception and filled the dialed proximal colon.

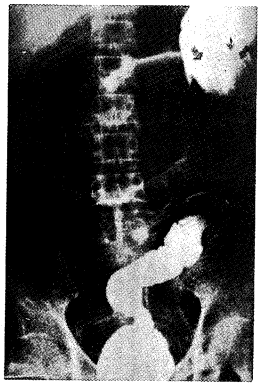


Fig.1 (Case 9) A 63-year-old man with ademonatous polyp at sigmoid colon causing retrograde colic intussusception (1a.) Barium enema demonstrated shorten and mild stretched sigmoid colon with sudden change in calibre, like bird's beak, at sigmoid colon. Barium had filled the smooth and marked narrow central canal about 15 cms.in length, and then calibre of barium column was suddenly changed again into the marked dilated proximal descending colon with the upward convexed cupping filling defect (thick arrow),represented the head of intussusception. Small polypoid filling defect (small arrow) was seen at lateral portion of the intussusceptum. (1b.) Later, retrogradely barium filling of the sheath from proximal to distal descending colon was seen as opaque cloak appearance with wide diameters surrounding the marked narrow central canal and was better demonstrated on the postevacuation film (1c.)

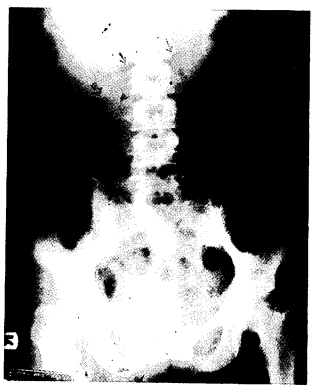
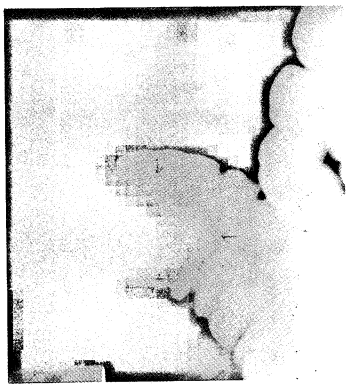


Fig. 2 (Case 4) A 40-year-old woman with polypoid mass of large cell lymphoma at terminal ileum causing direct ileocolic intussusception. (2a.) Plain film show sausage shaped soft tissue mass at mid upper abdomen with two undulating peripheral air strips (small arrows), narrow air filled lumen(arrow head), and bird's beak narrowing air filled gut which entered the area of intussusception.(thick arrow). (2b.) Barium enema revealed obstruction of barium flow suddenly at just distal to hepatic flexure with the formation of U shaped baruim head and partial concentric rings of barium. (2c.) The intussusceptum could be reduced back to the region of ileocecal valve(open arrow) without reflux of barium into terminal ileum,suggestive of incomplete reduction of ileocolic intussusception.



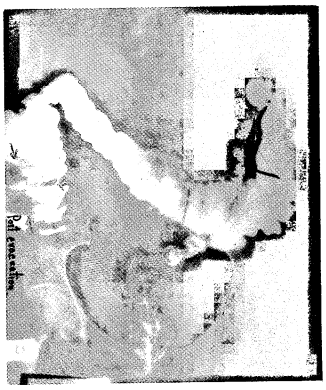
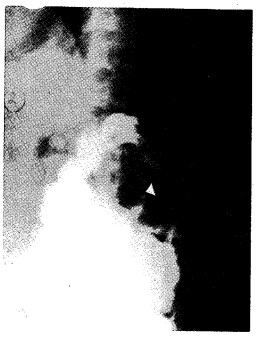


Fig. 3 (Case 5) An 82-year-old woman with intramural lipoma of cecum causing cecocolic intussusception.(3a.) Spot film of barium enema at hepatic flexure showed sudden obstruction of barium flow with cupping barium head (thick arrow) just distal to hepatic flexure and evidence of polypoid mass at head of the intussusceptum(samll arrow). (3b,3c,3d)Barium mild partially entered the sheath and demonstrated circular bands of barium. The intussusceptum could be completely reduced with barium filled appendix and the polypoid mass at lateral portion of cecum seen on the post evacuation film.

Fig. 4 (Case 6) A 75-year-old woman with intra-luminal smooth muscle tumor at transverse colon leading direct colic intussusception. (4a.) The film showed sudden obstruction of barium flow with the formation of cap liked barium head at proximal transverse colon. Short barium filled narrow central canal was demonstrated.(small arrow) (4b.) On post evacuation film, the intussusceptum slightly moved distally and barium filled in the sheath. (arrow head).

Fig. 5 (Case 7) A 54-year-old man with pedunculated submucous lipoma causing direct colic intussusception. The film revealed residual barium from previous upper GI study in the dilated proximal transverse colon with bird's beak appearance at distal end (small arrow). The barium enema was suddenly obstructed at mid descending colon with little barium filling of the sheath (arrow head) and evidence of polypoid mass at the head of intussusception (thick arrow). The sausage-shaped homogeneous soft tissue density between the bird's beak liked distal end of residual barium from upper GI study and the obstruction of barium enema is the extent of the intussusception.



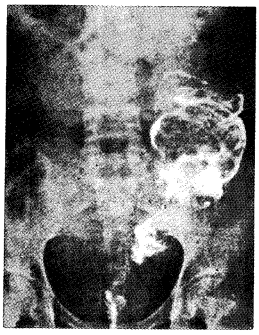


Fig. 6 (Case 8) A 32-year-old woman with signet ring cell carcinoma at descending colon leading direct colic intussusception. (6a.)Plain film showing sausage-shaped soft tissue mass with undulating peripheral air strips surrounding the mass (arrow heads) and a tumor at the head of the sausae mass (small arrows). (6b.) The lateral spot film of rectum revealed obstruction of barium flow at distal sigmoid colon with lobulated polypoid filling defect (small arrow). (6c,6d) The mass was moved back to proximal descending colon and obstruction of barium flow with cupping barium head and short barium filled central canal(white arrow head) were demonstrated on the oblique spot film (6c.) (6e.)On post evacuation film,the mass slightly moved distally and barium filled into the sheath,like coiled-spring appearance.

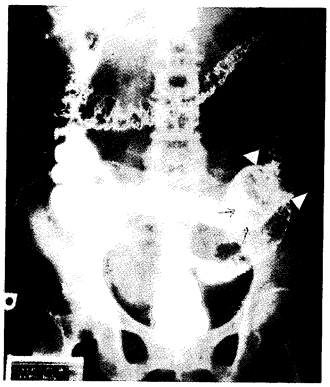


Fig. 7 (Case 2) A 59-year-old woman with peduculated polypoid mass of non-Hodgkin lymphoma at terminal ileum causing direct ileoileal intussusception. The post evacuation film of barium enema, which revealed normal study of large intestine,showed reflux of barium through the ileocecal valve into terminal ileum with demonstration of cap formation and coiled spring appearance(white arrow head).The polypoid mass (small arrow) at the head of intussusceptum was also demonstrated.

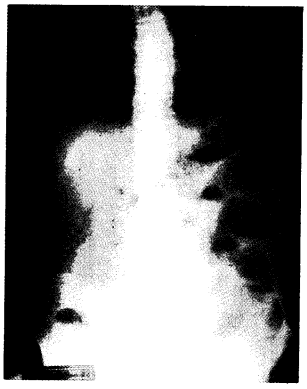


Fig. 8 (Case 3) A 64-year-old man with benign polyp of terminal ileum causing direct ileoileal intussusception which caused small intestinal obstruction. Plain film of abdomen on upright position showed air fluid levels in the dilated bowel loops.

DISCUSSION

Incidence of adult intussusception in all intussusception is low, approximately 4.5 - 16 % in

previous reports[2,3,4] , but it is relatively higher in this series. However, incidence of adult intussusception among general surgical patients and among all types of all patients at Chaoprayayommaraj Hospital, Suphanburi, in that 6 years period, are very low, approximately 0.01% and 0.001% respectively; and lower than the incidence at New York Hospital which were 0.094%[2] and 0.003%[2] respectively. In infancy and early childhood, intussusception is one of the most common surgical emergencies. But adult intussusception was accounted for only 5 %[1] of all cases of inteatinal obstruction andf is approximately 6.6 % in this series.

Incidence of the retrograde adult intussusception is very low, the ratio (incidence) of the retrograde adult intussusception to the all adult intussusception in previous reports were 1:201 (0.5%)[16], 2:400 (0.5%)[12], 6:1,000 (0.6%)[13], 3:154 (1.9%)[14], 5%[15], 5:40 (12.5%)[2]. And ratio of the retrograde colic intussusception to all retrograde intussusception were 1:613, 1:5[2] and to all adult intussusception were 1:1,000 (0.1%)[13], and 1:40 (2.5%)[2]. In this series, only one case of retrograde adult intussusception was found and as a colic type, so the ratio of retrograde colic intussusception to all adult intussusception is 1:9 (11%). The reason of relatively higher ratio in this series may be small samples of all adult intussusception. Retrograde colic intussusception in adults had been reported in few articles. Ralph A. (1953)[2] reported a case of reverse colocolic intussusception after withdrawal of the Miller Abbott tube in proximal ascending colon; Cecil Flemming (1937)[21] found a retrograde intussusception of the descending colon of which the apex was in transverse colon and the neck was in the region of the sigmoid colon ; Emlyn E.Lewis (1936)[20] found that the apex of the retrograde colic intussusception was the part of the pelvic colon opposite the longest portion of the pelvic mesocolon and it was intussuscepted back to the cecum; within a minute or two after Balfour (1918)[15] had readily reduced the retrograde intussusception of the sigmoid colon back to descending colon by traction at the operating table, a strong antiperistaltic activity set in the proximal sigmoid colon and it invaginated itself again until the portion of the bowel containing the tumor was drawn upward and completely engulfed by the proximal segment.

Exact mechanism that precipitates an intussusception is still unknown[4,7,11]. It has been generally believed that intussusception is induced by an irregular or increased peristalsis resulting from any irritant in the intestine or by lesion in the wall of intestine[2,4]. Stimulation of the intestine normally produces an area of constriction or spasm of intestine at or near the site of stimulus and relaxation of the intestine adjacent to the spasm, then the contracted portion may be drawn into relaxed portion by the longitudinal muscle fiber.

Mechanism of retrograde or reverse intussusception is essentially the same as in the ordinary case of intussusception. In stead of having normally peristalsis, the neuromuscular mechanism is thrown into reverse so that forceful antiperistalsis is provoked[5]. Antiperistalsis can occur in all portion of the gastrointestinal tract as its normal activity or when there is any stimulus in the inteatine which consist of a portion of intestinal wall which may cause

isoperistaltic intussusception, but if by vigorous peristalsis the intestine is unable to pass the stimulus distally, it reverses its direction and the stumulus is forced in the opposite direction[5,19].

Intussusception in adults is associated with a causative lesion in 75 to 90 % of case[1-3,10,11], and tumor related cause is most common, about 63%[22], 70%[1,2,9], 92%[2] of all cases. Benign tumors are more frequently found[3,7,23], about 60% of cases[23]. As in this series, all cases have leading causes and all of them are tumors which are benign about 55% (5 of 9 cases).

Polypoid and peduculated tumors are particularly inclined to intussuscept, though intussusception due to infiltrating , and even annular tumors occur[9]. Same as this series, 7 of 9 cases have pedunculated polypoid tumors, one has sessile polypoid mass, and another has intramural mass.

Although intussusception is relatively rare in adults, it can occur in all age group,ranged from second decade to ninth decade, and mean age of adult intussusception is in sixth decade[3,4,8,11]. In this series, mean age is 55 years and about 66% of cases are more than 50 years old. And about 67% of cases in this series are women, it is nearly equal to Ralph's series[2] in which 60% of cases were women, although a preponderance of men had been reported by others[1,3,23] and no sex predominance of adult intussusception is noted in some reports[4,11].

Intussusception in adults is not always an acute dramatic event, but may produce the picture of a chronic intermittent abdominal disease[9]. In this study, 5 of 9 cases had chronic symptoms about 1 month and more than 1 month before reaching the diagnosis of intussusception. The classic triad of abdominal pain, vomiting, and rectal bleeding which was encountered for 82%[11] of intussusception in children is rarely presented in adult intussusception. The presenting clinical picture of adult intussusception is not typical. Most common symptoms in this series are adbominal pain in addition to mausia and vomiting or mass. The second common clinical presentation is the picture of intestinal obstruction. And rectal bleeding is found only in one case.

The majority of signs are easy to understand if one realized that three concentric cylinders are presented in the region of the intussusception[9,10,19,24]. They form a narrow central canal which is surrounded by a thin peripheral sheath. Central canal and peripheral sheath are seperated by a wide space which is occupied by the intussuscepted mesentery as well as by the tissue of two complete intestinal walls, namely those of the in and outgoing part or afferent and efferent layers of the intussuscepted loop.

Plain supine and upright films of abdomen should be taken in any questionable abdominal cases,and certainly in any case suggestive of intussusception. Plain films can give diagnostic aid in 1/3 of all intussusception[6]. Direct of apecific signs are incliding of:- (1) sausage shaped, homogeneous soft tissue mass shadow with gas outline apex[1,9], this sign is most frequently found in this series, (2) two straight or undulating peripheral air strips or air rings surrounding the mass, represented air in the sheath [6,9], (3) narrow air filled lumen surrounded by a thick soft tissue mass cylinder or linear or curvilinear radiolucency within a soft tissue mass or

doughtnut-liked picture, if it ends on, this is very characteristic sign[6,9], but it is seen in only 2 cases of this series, (4) air filled gut which entered the area of intussusception like bird's beak, bicycle seat, cone shaped or funnel-liked narrowing[6,9], these 4 signs are well visualized in case 4 (Fig.2), (5) tumor causing obstruction can sometime seen at the head of sausage[9], this sign is well seen in case 8 (Fig.6). The indirect or nonspecific signs which may aid in diagnosis are including of :-(1) air-fluid levels in dilated loops in case with abstruction[1,9] (Fig.8), (2) scant or abscent colonic gas and fecal content or short Rt.colon in case of ileocecal intussusception [2,9].

Barium enema can give diagnosis of ileocolic and colocolic intussusceptions approximately or more than 80% of case[6]. In this series all of ileocolic,cecocolic,colocolic intussusceptions and even one case of terminal ileoileal intussusception could be diagnosed preoperatively by barium enema. The diagnostic signs are including of : -(1) retrograde barium filling per rectum stops suddenly with (2) the formation of a cap, concavity or U shape which corresponds to the head of intussusception[2,7,9] (3) barium may enter the sheath and demonstrate concentric rings or circular bands of barium, more or less parallel, like spiral picture, or "coiled spring appearance", this sign is extremely characteristic of intussusception[2,9]. Some authors[7] described as resembling a fork, pincers, onion, rosette, and opaque cloak, that is various degrees of impregnation of the sheath up to a complete hiatus. The sheath often acts like a blind alley preventing any further filling of the colon, so the pressure of the enema may then produce reduction of the intussusception. In case 5 of this series (Fig.3), complete reduction of the cecocolic intussusception was demonstrated. (4) if barium can enter the central canal, it is usually narrow and longitudinal line which seperated from the sheath by the wide nonfilled area[2,9], this is well demonstrated in case 9 (Fig.1). The narrowing ends fairly abruptly at the entrance of the intussusception. The colon proximal to the intussusception may or may not be dilated and it is shortened, depending on the degree of intussusception. (5) Smooth,granulated or ulcerated surface of tumor at the head of the sausage may be seen and usually better demonstrates on postevacuation film[9]. (6) On post evacuation film, the intussusception may change in position and shape[2]. In this study, all signs, exceptional the signs of barium filled central canal and changing in positions of the heads of intussusceptions, could be demonstrated in nearly all cases of which the heads of intussusceptions were in large bowel (Fig.1-6). (7) In case of ileoileal intussusception, if barium can reflux through the ileocecal valve into terminal ileum, sign of cap formation and coiled spring appearance can be demonstrated, also[6], as in case 2 of this series (Fig.7).

Peroral barium examination or long GI study is usually not necessary[9], it may be performed when plain films and barium enema have not been conclusive. It is not advisable in presence of definite obstruction, because it usually makes further more extensive intussusception.

In the case of retrograde or reverse colic intussusception, barium enema shows the same principally changes as in the direct intussuscep-

tion, but they are in retrograde or reverse fashion, or the signs are demonstrated serially same as peroral barium examination in the direct intussusception. In case 9 (Fig.1) barium enema initially demonstrated shorten and mild stretched sigmoid colon with sudden change in calibre, like bird's beak, at sigmoid colon. Then smooth thin opaque streak about 15 cms. in length was seen longitudinally from left lower quadrant to left upper guadrant of abdomen, represented the central canal. And when the barium had flowed beyond apex of the intussusception and filled the markedly dilated proximal descending colon just distal to splenic flexure, the lobulated and upward convex cupping filling defect was seen at that site. Further barium enema filled in the sheath with wide diameters surrounding the opaque streak of central canal serially from proximal to distal portions of descending colon, like opaque cloak appearance. At that time, the diagnosis of retrograde or reverse colic intussusception was considered, by barium enema. This case was operated after making baium enema for 2 hours, and operative findings were that the sigmoid colon intussuscepted into the lumen of the descending colon,tightly and irreducible. The whole mass from proximal descending colon to sigmoid colon was resected with end to end anastomosis. And the pathological diagnosis is polyp with intussusception and acute infarction. The patient uneventfully recovered.

However, in retrograde intussusception involving the large intestine, barium enema is contraindicated since all that would be accomplished would be an increase in size of the intussusception with an aggravation of symptoms[5].

In hospital which ultrasonography and/or computed tomography are available, the patients who have abdominal mass detected by physical examination and/or plain films of abdomen may be further evaluated by ultrasonography and/or computed tomography. Sonographic features of intussusception[25] include a soft tissue mass of bowel origin composed of multiple alternating echodense and echolucent rings or target liked pattern on transverse scan of the mass. The scan along the longitudinal axis exactly through the center of the intussusceptum shows four parallel strips of low echogenicity delineating three reflective area, called "hay-fork sign". If the longitudinal scan is not through the center of the intussusceptum,three strips of low echogenicity seperated by two hyperreflective strips are demonstrated.

Intussusception by the computed tomography[3,10] is characterized by "target" lesion and an intraluminal soft tissue mass, (a) thickening of the affected bowel segment, (b) an eccentrically located low density lesion owing to the fat content of the invaginated mesentery, (c) demonstration of the leading mass of the intussusceptum by air or barium, (d) reniform lesions associated with focal bowel wall ischaemia.

Treatment

Treatment of adult intussusception must be surgical[1,2]. Surgical resection or decompression is the appropriate treatment for symptomatic adult intussusception.

Intraoperative reduction might permit a more limited or avoid resection but there is a risk

of perforation of ischaemic bowel, anastomosis in a more edematous area, intraluminal seeding, or venous embolization of malignant cells. In patient over 60 years of age, no attempt at manual reduction should be made and primary resection is indicated,because of the high incidence of malinancy.

In contrast to the most cases of ileocolic, ileocecocolic, and colocolic intussusception in which primary resection is the treatment of choice, in jejunojejunal and ileoileal intussusception, an attempt at primary reduction followed by resection or enterotomy is justified.

Treatment of retrograde intussusception is early and adequate surgery also. The surgical procedure will depend on causal agent and the condition found at operation[5].

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