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## RESEARCH ARTICLE

PERFORATION OF MECKEL'S DIVERTICULUM BY CHICKEN WISHBONE – A CASE REPORT  
AND REVIEW OF LITERATURE.

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**Abstract**

Acute abdomen caused by perforation of Meckel's diverticulum by foreign body is extremely rare in adults. In this article, we report a case of perforated Meckel's diverticulum by a chicken bone with localized peritonitis in a 16-year old boy who presented to the hospital with complains of abdominal pain, episodes of vomiting and fever mimicking acute appendicitis. The purpose of this report is a review of the literature and to record a further case of perforation of Meckel's diverticulum by a foreign body.

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**Introduction:-**

Meckel's diverticulum is the incompletely obliterated remnant of the vitello – intestinal duct (also called omphalomesenteric duct) of the embryo. It is the most common congenital malformation of gastrointestinal tract (present in 2% – 4% of population) and was first described by Ruysch in 1701, but linked with the name of Johann Frederick Meckel, who established its embryonic origin in 1809.<sup>[1]</sup>

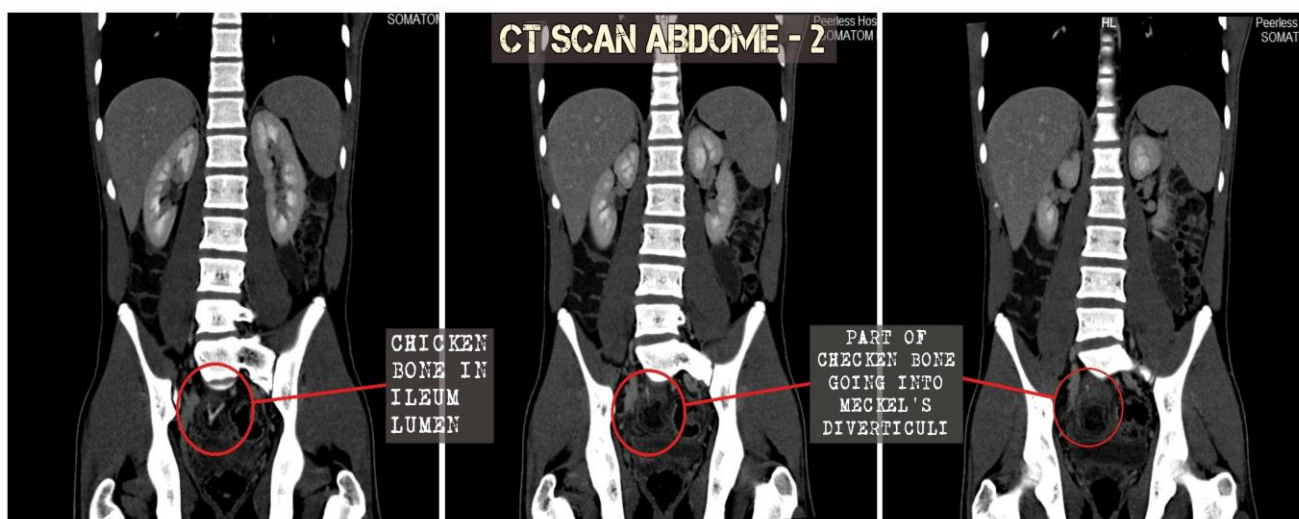
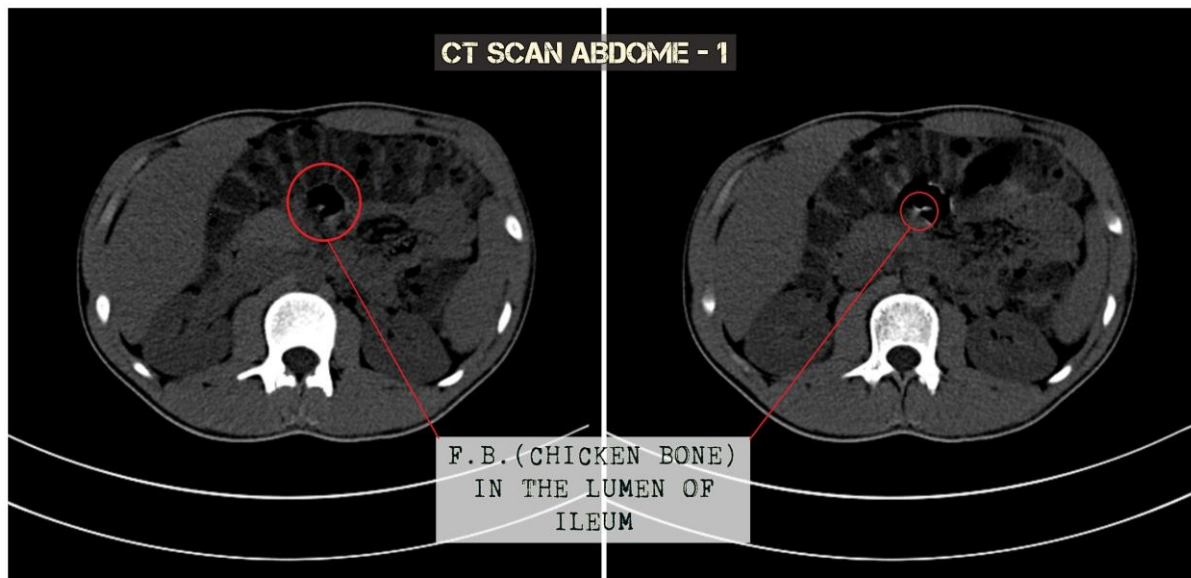
Though Meckel's diverticulum remains mostly asymptomatic throughout life with an overall lifetime complication rate of approximately 4%.<sup>[2]</sup>, complications of surgical importance such as bleeding (11.8%) intestinal obstruction (36.5%), inflammation (12.7%), intussusceptions (13.7%) and neoplasm (3.2%) have been described and commented on in previous literature. However, perforation of Meckel's diverticulum by a foreign body is one complication which has received comparatively little attention, perhaps owing to its rarity and, in a review, was reported as being responsible for 0.5% of symptomatic diverticula. <sup>[2]</sup>. In this article, we report a case of perforation of Meckel's diverticulum by a chicken bone with a brief review of the relevant literature and record a further case of this occurrence to the very few reported cases which can be found in the world literature.

**Case History:-**

We report the case of a 16 years old boy who presented in the Emergency Department complaining of pain abdomen, vomiting and fever for 3 days. The pain was sharp in nature, diffuse but more over right lower abdomen and periumilical region, which started 3 days ago and gradually increasing in intensity. The pain was associated with multiple episodes of vomiting episodes and intermittent high grade fever spikes. There was no significant past medical or surgical history and the patient was otherwise fit and healthy.

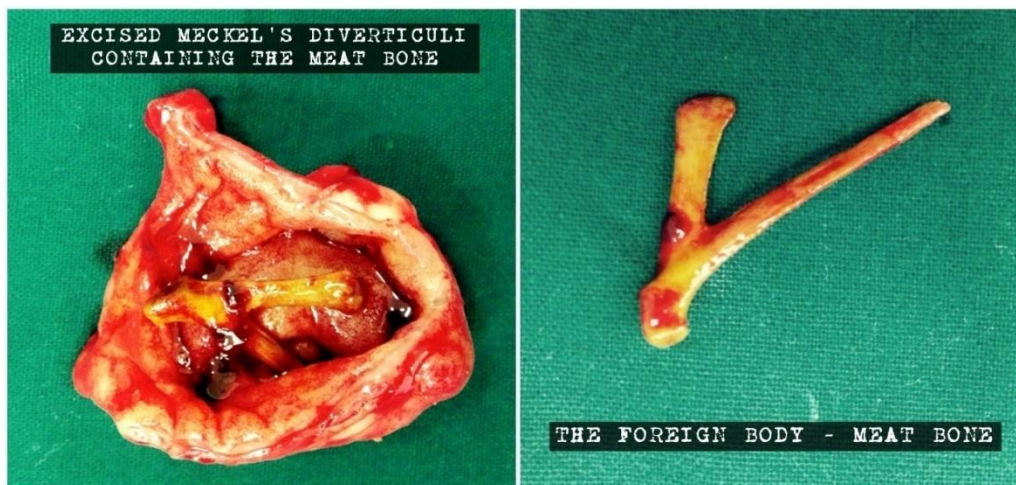
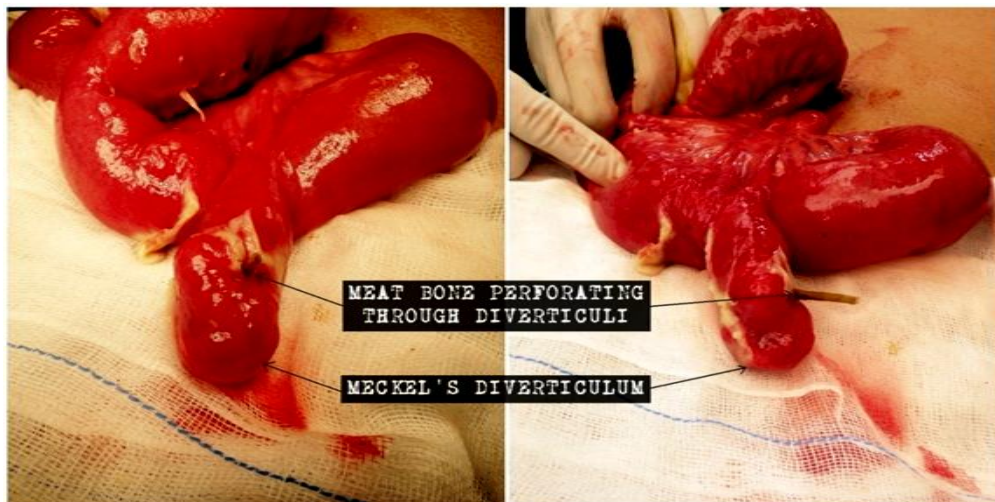
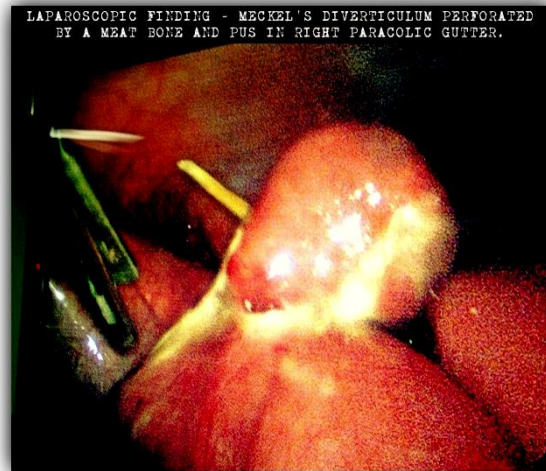
On clinical examination, patient was found to be febrile, pulse 104/min, BP 100/70 mmHg and O<sub>2</sub> saturation was 100%. He had no pallor, cyanosis or jaundice but was anxious and in pain. Chest, CVS and CNS examinations were unremarkable. His abdomen was rigid and diffusely tender, more severe over right iliac fossa. Liver dullness was not obliterated. There was guarding but no distension and the bowel sounds were absent. The rectovesical pouch was tender on per rectal examination. In the Emergency Department, he was managed with intravenous - fluids, adequate analgesics, broad spectrum antibiotics, and other supportive therapy and admitted under General Surgery.

Investigations revealed total WBC count of 19710 with neutrophilic leucocytosis of 90. Other routine haematological and biochemical parameters were within normal limits. (Platelets=2, 38,000, Sodium=136, Potassium=4.6, Amylase=42, Lipase=20, Creatinin=0.87, Urea=18 LFT=WNL). CT ABDOMEN revealed grossly distended ileal loops showing loss of normal mucosal pattern with large air-fluid levels in them. In one of the terminal ileal segment a Y-shaped hyperdense structure, probably bony in nature, was embedded in the wall and partially transgressing the wall, probably causing perforation and responsible for the symptomatology of the patient. Distal to this ileal segments are completely collapsed showing mild wall thickening and inflammation.



Patient was shifted to operation theatre and diagnostic laparoscopy revealed a perforated Meckel's Diverticulum secondary to a piece of a meat bone which was obstructing the neck of the diverticulum. There was pus in right paracolic gutter.

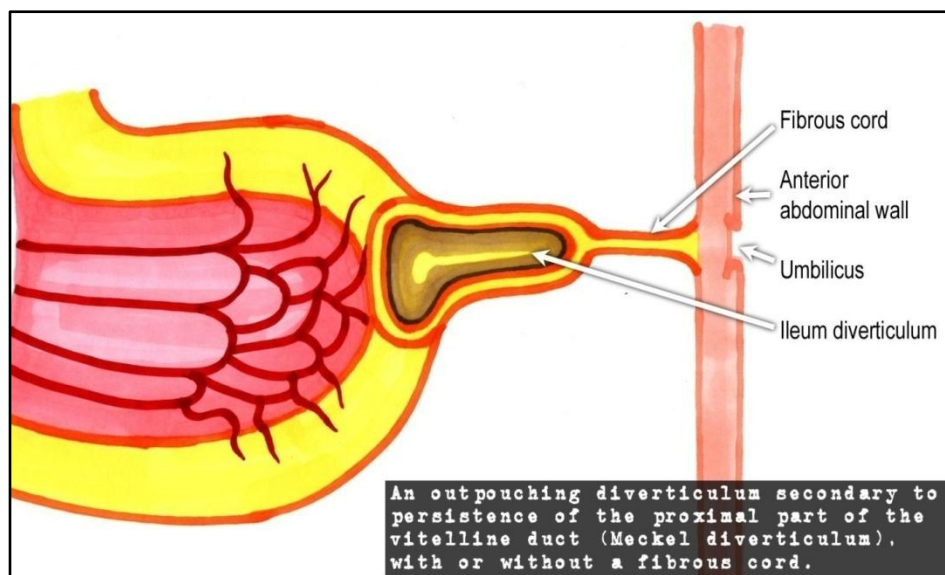
Laparotomy was done under general anaesthesia and resection and anastomosis of Meckel's Diverticulum along with appendisectomy and peritoneal toileting were performed. Tissue histopathology confirmed Meckel's Diverticulitis and chronic inflamed Appendicitis.



Post operative period was uneventful. Patient improved and was discharged in a clinically stable condition.

### Discussion:-

Meckel's diverticulum is the remnant of the vitelline or omphalomesenteric duct found in 2 percent of the general population and is the commonest congenital anomaly of the gastrointestinal tract [3]. This anomaly was first described by Ruysch in 1701 [1]. However, Johann Friedrich Meckel, a German comparative anatomist, was the first to publish a detailed description of the diverticulum's anatomy and embryology [4, 7, 8, 9] in a cadaver's study of 22 children. Most Meckel's diverticulum remain asymptomatic throughout life and the incidence of complications like hemorrhage, inflammation, intussusceptions, and perforation ranges from 4 to 16 % [3]. Perforation is a rare complication and occurs in only 0.5%, of which a fair number are due to diverticulitis and inflammation. A study done in Mayo Clinic [10] on 1478 patients with Meckel's diverticulum found only 2 patients with perforation of the diverticulum by a foreign body (fish bone).



We did a literature search on perforation of Meckel's diverticulum by foreign bodies [Table I below] where we could identify only 79 case reports till date since the first published case report in 1851 by Denunce. Fish bone is the commonest foreign body (45%) but perforation due to chicken bone is very rare with only five cases reported in the literature [11] and ours being the 6<sup>th</sup> reported case. Interestingly, the 'wishbone' of the chicken has been reported in the previous three out of five case reports, and also in our case.

There is a significant male preponderance and the mean age of the patients is around 30 years. The foreign bodies recorded in the case reports range from sharp objects like Fishbone, wood splinters, chicken bone, toothpicks, needles, pin etc to smooth ones like cherrystone, melon seeds, tomato skin, cabbage stalk etc. [Table I]. Thus, the mechanism of perforation cannot only be attributed to sharpness of the object, but may also result from a combination of local inflammation due to irritation by the foreign body and pressure necrosis of the diverticulum from attempts by peristalsis to push the foreign body out of the diverticulum as suggested by Ward-McGuard. [12].

The preoperative diagnosis of a symptomatic Meckel's diverticulum is very difficult because it can mimic common ailments causing acute abdomen, most commonly appendicitis [4]. In the majority of the case reports, perforation was slow; symptoms initially were rather mild and gradually progressed to intermittent pains in the right lower quadrant. Tenderness over the lower right abdomen, together with slight temperature elevation and leucocytosis were noted, which mimicked the diagnosis of "acute appendicitis with possible perforation." [12].

The preoperative diagnosis of perforated Meckel's diverticulum can only be made when a clear history of recently swallowed foreign body is given. In our literature search, we found only two cases where such diagnosis was made (Fontaine & Bauer (1933); Persson(1939). Though the majority of patients could not recall ingesting any foreign body, we found that radiological investigations like abdominal X-ray or computed tomography [CT] scan, or

diagnostic laparoscopy [12].helped in preoperative diagnosis of this condition in many of the recently reported cases. In our case, an initial diagnosis of acute appendicitis was made, only to be disproved after CT scan and diagnostic laparoscopy prior to operation.

In most of the previously reported cases, the diverticulum along with a segment of adjoining bowel was resected and end-to-end anastomosis was done after exploratory Laparotomy. Meckel's diverticulectomy or simple wedge resection has also been carried in some of the other patients. Both these operations had good outcome.

**Table I:-** summary of previous literature.

Sl	Year	Author	Age/ Sex	Type of FB	Pre op diagnosis/ Investigations	Operation
1.	1851	Denunce	?	Cherrystone		No operation, Post-mortem
2.	1852	Beale	14 / M	Cherrystone		No operation, Post-mortem
3.	1899	Blanc	41 / M	Fishbone		Recovered after operation
4.	1900	Piquard et al	45 / F	Fishbone		No operation, Post-mortem
5.	1909	Aschan	42 / M	Fishbone		Recovered after operation
6.	1912	Schwenk et al	21 / F	gramophone needle		Recovered after operation
7.	1920	Hagler et al	39 / M	Fishbone		Operation but Died
8.	1921	Henrichsen	25 / M	Fishbone		Recovered after operation
9.	1926	Lindquist	21 / M	Wood splinter		- d o -
10.	1927	Berry	36 / M	Wood splinter		- d o -
11.	1931	Walking	8 / M	fish bone		- d o -
12.	1832	Wilcox	71 / M	fish bone		- d o -
13.	1933	Hiller et al	41 / M	Tomato skin		- d o -
14.	1933	Bock	7 / M	Needle		- d o -
15.	1933	Webb	15 / F	Fishbone		- d o -
16.	1933	Fontaine et al	19 / F	Knitting needle		- d o -
17.	1937	Donovan	11 / M	Wood splinter		- d o -
18.	1937	Peterson	15 / F	Fishbone		- d o -
19.	1939	Persson	75 / M	Fishbone		- d o -
20.	1939	Persson	21 / M	Fishbone		- d o -
21.	1939	Persson	18 / M	Wood splinter		- d o -
22.	1940	Williams	62 / M	Fishbone		- d o -
23.	1940	Tamraz	49 / M	Fishbone		- d o -
24.	1942	Aguirre Silva	32 / M	Chicken bone		- d o -
25.	1942	Weinstein	54 / M	Fishbone		- d o -
26.	1943	Rossmann	17 / M	Fishbone		- d o -
27.	1948	Macfarlane	21 / F	Cabbage stalk		- d o -
28.	1950	Seibert	14 / M	Fishbone		- d o -
29.	1950	Ward-McQuaid	60 / M	Tomato skin		- d o -
30.	1951	Mastrosimone	14 / F	Ascaris		- d o -
31.	1951	Whelan	70 / M	Fishbone		- d o -
32.	1951	Blomquist	37 / F	Fishbone		- d o -
33.	1954	Longo&Brogg	32 / M	Artichoke spine		- d o -
34.	1955	Alhadeff	24 / M	Wood splinter		- d o -
35.	1955	John	10 / M	Pin		- d o -
36.	1956	Chorzewski	27 / F	Fishbone		- d o -
37.	1956	Rawlinson	57 / M	Fishbone		- d o -
38.	1956	Bernatz	52 / M	Fishbone		- d o -
39.	1957	Gillette et al	35 / F	Fishbone		- d o -
40.	1958	Reinalda	42 / F	Fishbone		- d o -
41.	1958	Rumore	41 / M	Fishbone		- d o -
42.	1959	Komarov	17 / M	Grape seeds		- d o -
43.	1960	Principe	9 / M	Prune stone		- d o -
44.	1961	Dowse	60 / F	Fishbone		- d o -

45.	1961	Dowse	9 / M	Tomato skin		- d o -
46.	1961	Ashe	34 / F	Wood splinter		- d o -
47.	1962	Ker	M	Fishbone		- d o -
48.	1963	Roesell	1.5 / M	Liberty bell		- d o -
49.	1964	Binks	12 / M	Fishbone		- d o -
50.	1965	Rosswick	28 / F	Fishbone		- d o -
51.	1976	<u>Pahomeanu</u>	?	fish bone	Appendicitis	- d o -
52.	1982	<u>Willis</u>	2½ / M	Battery	Known case/ x – ray	- d o -
53.	1983	<u>Greenspan</u>	53 / M	Toothpick	Appendicitis	- d o -
54.	1992	<u>Velanovich</u>	2	2 pennies	?	- d o -
55.	1994	<u>Halverson</u>	25 / F	Coin	PID	- d o -
56.	1997	<u>Bell</u>	46 / M	bay leaf	Appendicitis	- d o -
57.	1999	<u>Christensen</u>	24 / F	Fishbone	Appendicitis/ laparoscopy	- d o -
58.	2000	<u>Zingg</u>	31 / M	Toothpick	Appendicitis/ laparoscopy	- d o -
59.	2004	<u>Yagci</u>	30 / M	chicken bone	Appendicitis	- d o -
60.	2004	Shinohara	68 / M	fish bone	Peritonitis	- d o -
61.	2005	<u>Wong</u>		Fish bone	Appendicitis	- d o -
62.	2005	<u>Wong</u>		Fish bone	Appendicitis	- d o -
63.	2005	<u>Bhattacharjee</u>	1 / F	live roundworm	Intestinal obstruction	- d o -
64.	2007	Ayşe Karaman	child	button battery	NA	- d o -
65.	2009	Hoxha et al	50 / M	chicken bone	Appendicitis	- d o -
66.	2009	<u>Canelas</u>	52 / M	chicken bone	Appendicitis	- d o -
67.	2011	Hyun-Dong	46 / M	chicken bone	Bowel perforation/ CT scan	- d o -
68.	2012	Bülent Hayri	3 / M	button battery	Known case/ x – ray	- d o -
69.	2012	Bülent Hayri	5 / M	button battery	Known case/ x – ray	- d o -
70.	2012	S. Lindley	16 / M	metallic balls	Foreign body in bowel / x – ray	- d o -
71.	2013	<u>Cotirlet</u>	37 / M	chicken bone	Appendicitis/ laparoscopy	- d o -
72.	2013	<u>Mouawad</u>	52 / M	intact fish bone	Appendicitis/ laparoscopy	- d o -
73.	2013	<u>Anyfantakis</u>	4 / M	wood splinter	Appendicitis	- d o -
74.	2013	Dimitriou	64 / M	fish bone	Appendicitis	- d o -
75.	2013	Chia-Hung Su	4 / M	Pea-nut	Mesentery abscess/ laparoscopy	- d o -
76.	2013	Mathuran	78/ M	Lithiasis	lymph node/ laparoscopy	
77.	2014	<u>Okur</u>	8 / M	melon seeds	abdominal pain/ (CT) scan	- d o -
78.	2014	Hideki Shibata	41 / M	fish bone	Appendicitis / (CT) scan	- d o -
79.	2015	Costa D	54 / M	Nail	Foreign Body / Laparoscopy	Endoscopic Resection

### Conclusion:-

In conclusion, this case reinforces that perforation of Meckel's Diverticulum by a chicken bone is a rare complication and an uncommon cause of acute abdomen in adults. There are no specific physical symptoms or signs that can differentiate between perforation of Meckel's Diverticulum and acute appendicitis and can often be difficult to diagnose. Diagnostic laparoscopy and CT scan may be considered as useful tools in the preoperative diagnosis and management foreign body perforation of Meckel's Diverticulum. A segmental resection of the ileum, including the perforated Meckel's Diverticulum, may be a good surgical approach that has been used in the many of the previous cases with good results.

**References:-**

1. Rosswick RP. **Perforation of Meckel's Diverticulum by foreign bodies.** Postgrad.Med.J:1965;41:105-107
2. Hyun-Dong Chae. **Perforation of Meckel's Diverticulum by a Chicken Bone; Preoperatively Presenting as Bowel Perforation.** J Korean Surg Soc; 2011;80:234-237
3. Brian T. Kloss, Claire E. Broton & Anne Marie Sullivan. **Perforated Meckel diverticulum.** Int J Emerg Med (2010) 3:455-457
4. John J, Pal K, Singh VP. Perforated Meckels diverticulum causing giant pseudocyst and secondary appendicitis. Indian Pediatr. 2006;43:988-90.
5. Markogiannakis H, Theodorou D, Toutouzas KG, Drimousis P, Panoussopoulos SG, Katsaragakis S. Persistent omphalomesenteric duct causing small bowel obstruction in an adult. World J Gastroenterol. 2007;13:2258-60.
6. Rangarajan M, Palanivelu C, Senthilkumar R, Madankumar MV. Laparoscopic surgery for perforation of Meckel's diverticulum. Singapore Med J. 2007;:102-5.
7. Dumper J, Mackenzie S, Mitchell P, Sutherland F, Quan ML, Mew D. Complications of Meckel's diverticula in adults. Can J Surg. 2006;49(5):353-7.
8. Park JJ, Wolff BG, Tollefson MK, Walsh EE, Larson DR. Meckel diverticulum: the Mayo Clinic experience with 1476 patients (1950-2002). Ann Surg. 2005;241:529-33.
9. Yagci G, Cetiner S, Tufan T. Perforation of Meckel's diverticulum by a chicken bone, a rare complication: report of a case. Surg Today. 2004;34:606-8Goligher JC. Surgery of the anus, rectum and colon (3<sup>rd</sup> Edn) Bailliere Tindall, London. 1975; 205-255.
10. A. Coțîrleă, R. Anghel, E. Tincu, S. Rău, I. Moacă, E. Popa. **Perforation of Meckel's Diverticulum by Foreign Body, A Rare Complication** Chirurgia 2013; 3: 108: 411-413
11. Alam AM, Shuaib IL, Hock LC, Bah EJ A.L. Campos Canelas, A.N. Abud Neto et al. **Perforation of Meckel's diverticulum by a chicken bone mimicking acute appendicitis. Case report** G Chir Vol. 30 - n. 11/12 - pp. 476-478
12. Carl W. Roessel, **Perforation of Meckel's Diverticulum by Foreign Body: Case Report and Review of the Literature** Annals of Surgery;156:6; 972-975
13. Borovoi SV. **Perforation of Meckel's diverticulum by a chicken bone.** (Russian) Klin Khir. 1990;(2):58 (Abstract).
14. Koussidis A, Dounavis A. **Acute appendicitis as a diagnostic error. Perforation of Meckel's diverticulum by a chicken bone.** (German) Zentralbl Chir. 1983;108:1525-6 (Abstract).
15. Roessel CW. **Perforation of Meckel's diverticulum by foreign body: case report and review of the literature.** Ann Surg. 1962;156:972-5.
16. JH, Suhaili DN, Kok KY. **Fish bone perforation of Meckel's diverticulum: a rare event?** Asian J Surg. 2005; 28:295-6.