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Megacolon, Rare Mode of Revealing an Isolated Pheochromocytoma: Role of Catecholamines, A Case Report

Rolly Junior Louzolo-Kimbembe[1*], Maryame Ben Lafqih[1], Sana Rafi[1], Ghizlane El Mghari[1], Nawal El Ansari[1]

[1]Department of Endocrinology, Diabetology, Metabolic Diseases and Nutrition, Mohammed VI University Hospital of Marrakesh, Morocco

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***Corresponding author:** Rolly Junior Louzolo-Kimbembe

Abstract **Case Report**

In the early 50s, some authors had already described the effects of catecholamines on the intestine, by the continuous infusion of noradrenaline into rabbits causing significant dilation of their colon. Most of the time, high levels of circulating catecholamines in secreting pheochromocytomas, can disturb the intestinal function giving a protean clinical presentation of the pheochromocytomas. As a result of these catecholamines, their morbidity and mortality are mainly of cardiovascular origin, but digestive morbidity and mortality is also significant due to severe cases of complete intestinal paralysis mediated by catecholamines, which can lead to extreme digestive pictures.

Keywords: Phechromocytoma, catecholamines, ileus, megacolon.

INTRODUCTION

Pheochromocytoma is a rare neuroendocrine tumor secreting catecholamines. The clinical and biological expression is the reflection of this hormonal secretion, typically, hypertension is an indicator. But the symptomatology can be fluctuating sometimes non-specific and therefore the clinical manifestations very variable from one patient to another, at any time. Thus, digestive symptoms including abdominal pain, vomiting are also described in cases of pheochromocytomas. On the other hand, cases of megacolon are very rarely reported, especially in case of discovery of a pheochromocytoma outside the genetic context. We report the case of a patient treated for pheochromocytoma revealed by a sub-occlusive syndrome whose imaging has objectified a megacolon and establish the cause-and-effect link between the secretion of catecholamines and the occurrence of a megacolon.

PATIENT AND OBSERVATION

A 41-year-old man, with no particular personal and family history, especially not known to be diabetic or hypertensive, no history of lithiasis pathology, who presented 5 months before his hospitalization, constipation with abdominal distension, treated symptomatically by a general practitioner as a functional bowel disorder. This was followed by a picture of intestinal sub-occlusion with stopping of faecal matters, no stopping of gas, no vomiting, and worsening of abdominal meteorism. An abdominal CT (computed tomography) scan was performed in the emergency unit and showed significant distension of the colonic frame extended to the rectum measuring 9 cm in large diameter and ileal loops measuring 4.8 cm in large diameter, containing faecal matters without hydro-aeric level as well as a left adrenal incidentaloma of 6.5x6.3cm, confirmed by an adrenal CT which specified a left adrenal mass of 7.5x6.5cm with spontaneous density of 43 HU. The patient was hospitalized with a very distended abdomen, placed on a nasogastric tube for nasogastric aspiration to ensure decompression, on a systemic osmotic laxative and a rectal laxative for rectal bulb enema. Regular blood pressure monitoring indicated very high figures, up to 210 / 140mmHg and the dosage of the urinary catecholamines was then performed and came back largely positive between 3 and 161 times normal (Table 1). The diagnosis of pheochromocytoma was made, the patient was placed on alpha blocker and calcium channel blocker, further examination noted the absence of marfanoid dysmorphia, absence of mucosal neuromas and the MEN2 (multiple endocrine neoplasia type 2) assessment returned to normal. The patient was operated on after stabilization of the arterial pressure, vascular filling and improvement of the digestive picture. Surgery by laparotomy allowed the extraction

of a mass measuring 8x10 cm and there was no volvulus, no obstruction, no perforation in the intestine. The pathological result was in favor of a pheochromocytoma with a PASS score of 5. Metaiodobenzylguanidine (MIBG) scintigraphy was performed postoperatively, without fixation

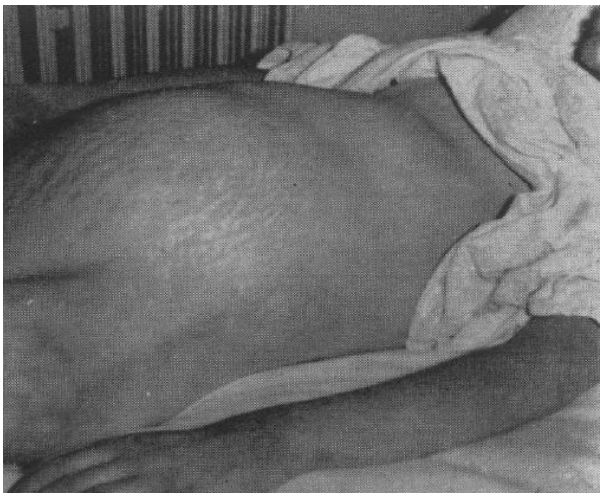

Figure 1: Abdominal distension (black and white picture)

Table 1: Patient's catecholamines values

Catecholamines	Results (µg/24h)	Normal values (µg/24h)
Adrenaline	194	< 18 or 11 times normal
Noradrenaline	13396	<83 or 161 times normal
Dopamine	1332	<460 or 3 times normal

DISCUSSION

Classically, the Ménard triad characterizes pheochromocytoma with headaches, palpitations and profuse sweating, which constitute a set of pathognomonic signs, representing the systemic effects of hormonal secretion. But these symptoms may not always exist and when they are present the triad is not always complete. Some less specific signs can be emphasized in the clinical picture and with our patient the digestive manifestations were in the foreground, as he did not report any of the characteristic elements of the Menard triad, thus delaying the suspicion of a pheochromocytoma. These digestive manifestations are often overlooked and can explain significant morbidity and mortality. Indeed, there are several case reports of patients with pheochromocytoma who have had severe constipation leading to paralytic ileus, intestinal ischemia, gastrointestinal bleeding and even perforation of the colon [1]. If these digestive manifestations in pheochromocytoma are often reported, megacolon is rarely seen. Megacolon is a large and permanent dilation of the colon. The differential diagnoses for megacolon include congenital aganglionic megacolon in Hirschsprung's disease and toxic megacolon in inflammatory bowel disease and infections, particularly Clostridium difficile that can lead to pseudomembranous colitis. Other causes include Chagas' and Parkinson's disease, diabetic neuropathy, myotonic dystrophy, hypothyroidism, amyloidosis, and medications such as risperidone and loperamide [2]. Pheochromocytoma, on the other hand, is not always considered in the differential diagnosis of megacolon [3]. The pheochromocytoma is genetic in 10% of cases and is then integrated either with a MEN 2, a type 1 or 2 neurofibromatosis or even familial paragangliomas and patients with MEN 2B and neurofibromatosis develop megacolon related to the diffuse ganglioneuromatosis of the colon in MEN 2B that causes dysmotility syndrome that precipitates megacolon [3].

On the other hand, in the vast majority of cases, pheochromocytoma is sporadic, such is the case with our patient and in this situation it is the high and sustained levels of catecholamines secreted by the tumor that can decrease peristalsis and intestinal tone leading to constipation, precipitating ileus and leading to megacolon [2]. In fact, catecholamines and opiates inhibit the release of acetylcholine in enteric neurons [4]. Since acetylcholine is involved in the initiation of muscle contraction, its inhibition results in an inhibition of intestinal smooth muscle contraction, that initially manifests as intermittent constipation, and when catecholamine levels become consistently high, it can precipitate severe ileus and megacolon. Data from the literature suggest that the larger the tumor, the more massive the release of catecholamines and the more prone the patient is to ileus and megacolon [3, 5]. In a series reported in the literature, 7 patients who presented with ileus each had a fairly large pheochromocytoma with catecholamine levels at least 2 times higher than normal [6]. Other data in the literature have shown that only patients with larger pheochromocytoma with circulating catecholamine

levels nearly 4 times higher than normal developed megacolon [3]. The hypothesis is that factors other than serum catecholamines might play a role in the development of ileus or megacolon as there is evidence that opioid peptides can be synthesized and secreted by pheochromocytomas [7]. Opioids like catecholamines also inhibit intestinal peristalsis by blocking the action of acetylcholine, so there is during pheochromocytoma a double inhibitory action of intestinal motility, making pheochromocytoma a tumor very associated with digestive disorders of variable importance which can range from constipation to megacolon via an ileus, depending on the constancy and the degree of secretion of the tumor.

In addition, another fact caught our attention, the rare case reports in the literature about the link between pheochromocytoma and the occurrence of a severe digestive picture (severe ileus or megacolon) noted that among the catecholamines secreted, the level of noradrenaline was always higher than other catecholamines, that was also the case in our patient who had a level of noradrenaline much higher than other catecholamines (Table 1). This more specific effect of noradrenaline on the intestine was initially described by Blacket et al. in 1950. They continuously infused noradrenaline to four rabbits over 4 days. This resulted in the premature death of one rabbit that at autopsy was found to have enormous dilatation of the large gut. Two of the other rabbits subsequently became ill and on postmortem exam also exhibited gross dilatation of the terminal large gut [8].

But this cause and effect relationship between the release of catecholamines and the occurrence of ileus and megacolon in pheochromocytoma has also been established by a reverse procedure. In fact, some patients with pheochromocytoma presenting severe ileus showed a spectacular improvement in their digestive picture after administration of an alpha adrenergic blocker, that was also the case in our patient, the proof that alpha adrenergic activation by high levels of circulating catecholamines is largely responsible for the occurrence of severe ileus and megacolon in patients with pheochromocytoma [9, 10].

CONCLUSION

We have reported the case of a patient with no particular history who did not present with typical signs of pheochromocytoma but a severe digestive picture with megacolon that revealed a highly secreting pheochromocytoma.The direct cause and effect link between the secretion of catecholamines by pheochromocytoma and the occurrence of constipation, ileus and megacolon has been well established.Thus, any digestive picture of this kind should not overlook a pheochromocytoma.On the other hand, in the context of MEN2 in particular MEN2B, gastrointestinal disorders linked to a modification of motility (constipation, diarrhea and sometimes megacolon) are frequent and attributed to diffuse intestinal ganglioneuromatosis [11] but MEN2B beingextremely rare, it is difficult to evoke it from the only digestive table.

REFERENCES

1. Thosani, S., Ayala-Ramirez, M., Roman-Gonzalez, A., Zhou, S., Thosani, N., Bisanz, A., & Jimenez, C. (2015). Constipation: an overlooked, unmanaged symptom of patients with pheochromocytoma and sympathetic paraganglioma. *European journal of endocrinology*, *173*(3), 377-387.
2. Xu, L., Shek, K. W., Wong, K. C., Tong, K. L., & Hau, M. N. (2019). Megacolon as the presenting feature of multiple endocrine neoplasia type 2B: a case report. *Hong Kong medical journal= Xianggang yi xue za zhi*, *25*(6), 483-486.
3. Sweeney, A. T., Malabanan, A. O., Blake, M. A., de las Morenas, A., Cachecho, R., & Melby, J. C. (2000). Megacolon as the presenting feature in pheochromocytoma. *The Journal of Clinical Endocrinology & Metabolism*, *85*(11), 3968-3972.
4. Libert, N., De Rudnicki, S., Cirodde, A., Janvier, F., Leclerc, T., Borne, M., & Brinquin, L. (2009, November). Utilisation des médicaments prokinétiques en réanimation: indications et limites?. In *Annales francaises d'anesthesie et de reanimation* (Vol. 28, No. 11, pp. 962-975). Elsevier Masson.
5. Noguchi, M., Taniya, T., Ueno, K., Yagi, M., Izumi, R., Konishi, K., & Miyazaki, I. (1990). A case of pheochromocytoma with severe paralytic ileus. *The Japanese journal of surgery*, *20*(4), 448-452.
6. Cruz, S. R., & Colwell, J. A. (1972). Pheochromocytoma and ileus. *Jama*, *219*(8), 1050-1051.
7. Wilson, S. P., Cubeddu, L. X., Chang, K. J., & Viveros, O. H. (1981). Met-enkephalin, leu-enkephalin and other opiate-like peptides in human pheochromocytoma tumors. *Neuropeptides*, *1*(4), 273-281.
8. Blacket, R. B., Pickering, G. W., & Wilson, G. M. The effects of prolonged infusions of noradrenaline and adrenaline on the arterial pressure of the rabbit. *Clinical Science*, 9(2), 247-257.
9. Bernstein, A., Wright, A. C., & Spencer, D. (1967). Phaeochromocytoma as a cause of gastro-intestinal distension. *Postgraduate medical journal*, *43*(497), 180-183.
10. Khafagi, F. A., Lloyd, H. M., & Gough, I. R. (1987). Intestinal Pseudo-Obstruction In Pheochromocytoma. *Australian and New Zealand journal of medicine*, *17*(2), 246-248.
11. Daly, P. A., & Landsberg, L. (2019). Néoplasies endocriniennes multiples type 2B. Le Manuel MSD.