

## Colon cancer adrenal metastasis: case report and review of the literature

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**SUMMARY:** Colon cancer adrenal metastasis: case report and review of the literature.

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*The authors report a case of alone right adrenal metastasis from colon carcinoma discovered incidentally by CT scan imaging 4 years after colon resection in a 74-year-old man. The presence of metastasis in the adrenal glands represents the second most frequent cause of "adrenal incidentaloma", following cortical-adrenal adenomas. The most common primary tumors responsible for adrenal metastasis are carcinoma of the lung, breast and kidney.*

*Alone adrenal metastases due to colon or rectal carcinoma is very rare. Due to their rarity, at present there are not randomised studies supporting the effectiveness of surgery. Nevertheless, on the basis of international Literature and our experience of adrenalectomy could represent the current "gold-standard" therapeutic approach.*

**RIASSUNTO:** Metastasi surrenalica da cancro del colon: presentazione di un caso e revisione della letteratura.

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*Gli Autori descrivono un caso di metastasi surrenalica destra isolata da cancro del colon in un uomo di 74 anni di età, scoperta incidentalmente mediante esame TC quattro anni dopo la resezione colica. La presenza di metastasi nelle ghiandole surrenaliche rappresenta la seconda causa in ordine di frequenza di "incidentaloma del surrene", dopo gli adenomi cortico-surrenali. I tumori primitivi più comuni responsabili delle metastasi surrenaliche sono i tumori del polmone, della mammella e del rene.*

*La presenza di metastasi surrenaliche isolate da carcinoma del colon-retto è molto rara. A causa della relativa rarità al momento attuale non esistono studi clinici randomizzati che dimostrino l'efficacia del trattamento chirurgico. Sulla base della letteratura internazionale e della nostra esperienza, attualmente l'adrenalectomia rappresenta comunque l'approccio terapeutico ideale in caso di lesioni isolate.*

**KEY WORDS:** Colon cancer - Metastatic adrenal tumor - Adrenalectomy - Laparoscopy.  
Cancro del colon - Tumore surrenalico metastatico - Adrenalectomia - Laparoscopia.

### Introduction

All tumours spreading beyond minor circulation may produce adrenal haematogenous metastasis. The presence of metastasis in the adrenal glands represents the second most frequent cause of "adrenal incidentaloma", following

cortical-adrenal adenomas. The most common primary tumors responsible for adrenal metastasis, not rarely bilateral, are carcinomas of the lung, breast and kidney. In this cases adrenal metastases are not rarely bilateral.

Adrenal metastases from colorectal cancer are not rare findings in autoptic reports. Generally adrenal metastases are considered to depend by haematogenous spread of the primary carcinoma and to be unsuitable for surgical resection. In fact, at autopsy the majority of patients with colon cancer adrenal metastases have several other metastases.

The presence of lonely adrenal metastasis from colon or rectal carcinoma is very rare. The Authors report an unusual case of right adrenal metastasis occurred four years after right hemicolectomy for adenocarcinoma of the ascending colon.

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## Case report

A 74-year-old man underwent radical resection of a primary colon cancer in May 2002. It was an adenocarcinoma of the ascending colon infiltrating the muscular wall and stretching into the sub-serosa. There was no evidence of metastasis in regional lymph nodes or other more distant areas (T3 N0 M0, Stage II A). The post-operative course was uneventful and the patient was introduced in a follow-up program, including yearly total-body CT scan and abdominal ultrasonography every six months. The patient was treated with chemotherapy based on 5-fluoracil and mitomicine-C.

In January 2006, the abdomen CT showed the presence of a 4x5 cm solid expanding lesion on the right adrenal side, absent in the CT scan one year before. The patient was completely asymptomatic. The physical examination was normal, as well as the laboratory tests, including CEA. There was a slight increase of hepatic transaminases (GOT-AST 94 U/L; GPT-ALT 96 U/L). The presence of expanding lesion was confirmed by MRI examination.

Therefore a right adrenalectomy was performed. The exploration of the abdomen revealed the absence of any adenomegalies or other metastatic lesions. At histology the right adrenal gland was nearly completely occupied by a yellowish neoplastic-like tissue, necrotic and soft, which the definitive histology classified as adrenal metastasis from intestinal adenocarcinoma (Figs. 1 and 2).

Patient's post-operative course was uneventful. The patient was discharged 4 days after operation. A new cycle of chemotherapy with 5-fluoracil and mitomicine-C was administrated. Ten months after second surgery, the patient is in good general conditions, with no clinical or radiological evidence of disease relapse.

## Discussion

The most common primary tumors responsible for adrenal metastasis are carcinomas of the lung, breast and kidney. Adrenal metastases from colo-rectal carcinomas are less frequent (Table 1) In literature the global incidence of adrenal metastasis ranges between 8.6% and 27%, while the incidence of adrenal metastasis from colo-rectal cancer ranges from 1.9% to 17.4% (1,2). Adrenal metastases are found more frequently in males, with an average age over 58 (range 42-77).

Pre-operative diagnosis is very hard, because adrenal metastases are generally asymptomatic (73% of cases), and they are prevalently revealed by autopsy (3). The rate of detection of clinically silent adrenal masses has increased due to the widespread use of abdominal imaging including ultrasonography, CT, and MRI. Generally clinical suspicions, as in our case, are raised by instrumental examinations, such as CT scans performed during post-operative follow-up.

The most frequent symptom is the pain, observed around 25% of patients, as reported by Lo et al. (13 out of 52 patients) and by Kim et al. (9 out of 37 patients) (3,4). In case of bilateral metastases, there may be a picture of adrenal insufficiency (5). The incidence of bilateral adrenal metastasis is rare. Two cases are described by Kim (one from colon adenocarcinoma, one from kidney carcinoma), two cases are described by Lo and one by Moreno (3-5).

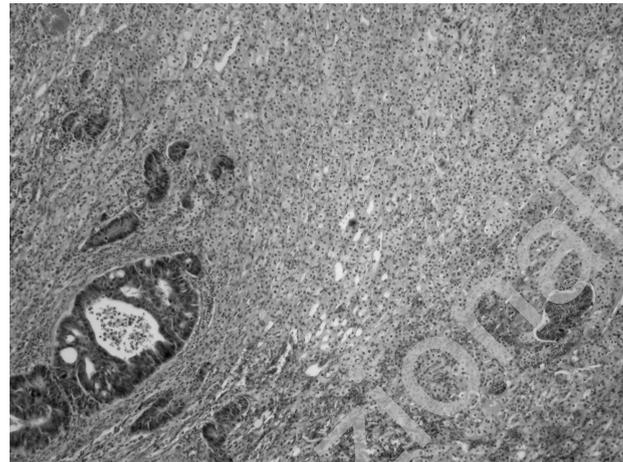


Fig. 1 - Right adrenal gland resected contained a tumor 4x5 cm in size (Haematoxylin and Eosin, x250).

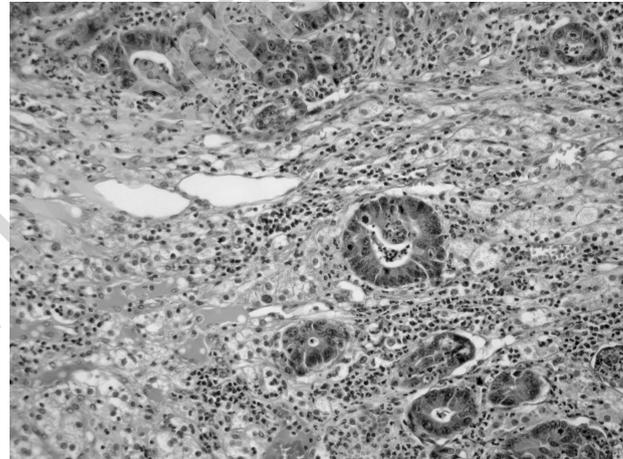


Fig. 2 - Histopathological examination of adrenal tumor showed adenocarcinoma compatible with metastasis from the colon carcinoma (Haematoxylin and Eosin, x250).

TABLE 1 - ADRENAL METASTASIS INTERNATIONAL SURVEY (2008).

Author	Total metastasis (n)	Metastasis from colo-rectal cancer (n)
Moreno [5]	1	1
Katayama [6]	1	1
Candel [10]	39	5
Kim [3]	37	6
Lo [4]	52	14
Watatani [7]	3	3
Wade [11]	47	8

The values of tumoral markers, CEA in particular, may be high but not rarely CEA dosage remains within the normal range. CT scans allow diagnosis of the adrenal masses with fair accuracy, also in subcentimetric le-

TABLE 2 - MODELS OF SURGICAL APPROACH TO ADRENAL METASTASIS.

Laparoscopic approach	Open approach
Intra-capsular lesions, lacking signs of invasion of the region, lymph nodes or other distant lesions	Diagnostic images indicating local or vascular invasion, lymphadenopathies or other distant metastasis

sions. However, they do not provide any distinction between primitive lesions, incidentalomas and secondary lesions. Percutaneous fine needle-biopsy was therefore proposed in order to provide a complete diagnosis, excluding false positives and attaining histological confirmation. This procedure does not always identify primitive lesions, but it can allow to distinguish between incidentalomas and metastasis.

In many cases, adrenal metastases are associated to lung metastasis. This does not exclude the surgical treatment of both lesions. Generally adrenal metastasis from colo-rectal cancer is considered to result from haematogenous spread of the primary carcinoma. Katayama et al. suggested that there is a route of hematogenous metastasis from the primary lesion via the lung to the adrenal glands (6). Other authors believe that these secondary lesions, especially for the right adrenal gland, may derive from hematogenic neoplastic dissemination as well as from the vascular modifications correlated to right hemicolectomy with lymphadenectomy (7). The presence of alone adrenal metastasis from colon or rectal carcinoma as described in our case is very rare (8).

The involvement of the adrenal glands by secondary lesions may be associated with lung metastases and neoplastic infiltration of other organs without negatively affecting the prognosis (5). Indeed, Kim describes cases where the patient underwent both hepatic resection and adrenalectomy, for the presence of hepatic and adrenal secondary lesions from right colon cancer with survival

until to 21 months (3). Though the studies in Literature does not prove that surgery can modify the natural course of the disease, it does remain the therapy of choice (9). Surgical procedure includes adrenalectomy, removing the gland without damaging the capsule to avoid neoplastic dissemination, and resection of the infiltrated tissue or other affected organs. In case of alone adrenal metastasis, limited within the capsule, a laparoscopic approach is a reliable option (1). Minimally-invasive treatment is indicated when the preoperative instrumental show no tumoral infiltration of the surrounding organs, no lymphadenopathies and no extra-adrenal metastasis (Table 2).

In the majority of cases, with at 18 months median follow-up (range 1-18 months) average post-operative survival is about 21 months, with a 5-year survival rate of 24%. The average rate of disease free survival is 11%, with a 5-year rate of 21% (3).

## Conclusion

Due to the relative rarity of adrenal metastasis from colo-rectal cancer, there are not randomised studies supporting the effectiveness of surgical treatment (10). Nevertheless, on the basis of our experience and international Literature, we believe that adrenalectomy in patients with alone lesions represents at present the "gold-standard" therapeutic approach.

## References

1. Suzuki H. Laparoscopic adrenalectomy for adrenal carcinoma and metastases. *Curr Opin Urol* 2006;16(2):47-53.
2. Murakami S, Terakado M, Hashimoto T, Tsuji Y, Okubo K, Hiramatsu R. Adrenal metastasis from rectal cancer: report of a case. *Surg Today* 2003; 33(2):126-130.
3. Kim SH, Brennan MF, Russo P, Burt ME, Coit DG. The role of surgery in the treatment of clinically isolated adrenal metastasis. *Cancer* 1998; 82(2):389-394.
4. Lo CY, van Heerden JA, Soreide JA, Grant CS, Thompson GB, Lloyd RV, Harmsen WS. Adrenalectomy for metastatic disease to adrenal glands. *Br J Surg* 1996; 83(4):528-31.
5. Moreno-Elola A, Moreno-Gonzalez E, Alonso-Casado O, Meneu-Diaz JC, Garcia-Garcia I, Abradelo-Usera M. Exceptional bilateral adrenalectomy after secondaries from colorectal cancer. *Hepato-Gastroenterology* 2004; 51(55):103-105.
6. Katayama A, Mafune K, Makuuchi MA. Adrenalectomy for solitary adrenal metastasis from colorectal carcinoma. *Jpn J Clin Oncol* 2000; 30(9):414-416.
7. Watatani M, Ooshima M, Wada T, Terashita H, Matsuda T, Shindo K, Yasutomi M. Adrenal metastasis from carcinoma of the colon and rectum: a report of three cases. *Surg Today* 1993; 23(5):444-448.
8. Komuro Y, Watanabe T, Kanazawa T, Tada T, Fukatsu K, Hosaka A, Hata K, Nagawa H. A case of adrenal metastasis from rectal carcinoma without lung metastasis: evolution for alteration of loss of heterozygosity and immunohistochemical expression. *J. Gastroenterol* 2004; 39(6):594-595.
9. Fujita K, Kameyama S, Kawamura M. Surgically removed adrenal metastasis from cancer of the rectum. *Dis Colon rectum* 1998; 31(2):141-143.
10. Candel AG, Gattuso P, Reyes CV, Prinz RA, Castelli MJ. Fine-needle aspiration biopsy of adrenal masses in patients with extraadrenal malignancy. *Surgery* 1993; 114(6):1132-7.
11. Wade TP, Longo WE, Virgo KS, Johnson FE. A Comparison of adrenalectomy with other resections for metastatic cancer. *Am J Surg* 1998; 175(3):183-6.