

The Application of Computed Tomography Scanning in the Prevention of Ovarian Cancer

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Abstract. When ovarian cancer is found, it is usually in the late stage, whether the survival rate of the patients can be improved or not lies in the ideal cytoreductive surgery and appropriate chemotherapy. With the development of imaging technology, CT is widely used in the diagnosis and treatment of ovarian tumor, the diagnosis of operation, and the prediction of the reduced scope of cells, as well as the cytoreductive surgery and some other aspects, which has very important clinical value. In this paper, it takes CT diagnosis of ovarian cancer as the breakthrough point, with the help of the analysis of clinical cases of ovarian cancer, discussing CT findings and its pathological basis, as well as the value of the prediction of cytoreductive surgery of CT.

Introduction

Ovarian cancer ranks the second place among the common gynecologic malignant tumors, however the mortality rate is in the first place, about 0.2million patients are diagnosed in the late stage, because the prognosis can be changed with the degree of spread, therefore, in five years, the survival rate is only 46%. Computed tomography (CT) scanning has very important clinical value in the diagnosis of primary ovarian cancer, the staging of cancer and tumor recurrence, as well as in the aspects of diagnosis and treatment.

CT Diagnosis of Ovarian Cancer

CT can have higher density resolution rate, which can well determine the tumor size, internal structure, surface profile and the existence of liver metastasis, lymph node metastasis, ascites and peritoneal dissemination. The features of CT diagnosis of ovarian cancer can be including the substantial heterogeneous mass, the cyst wall with papillary structure (commonly is >2cm) with membrane hybrid cyst or thickening of the tumor capsule invasion; tumors attack the envelope, and after the destruction of envelope, it will have direct invasion of the adjacent organs, then having extensive abdominal diffusion planting, which also can transfer the lymph node with metastasis with less hematogenous metastasis; it is easy to determine the diffusion of CT on the pelvic peritoneum and lymph nodes. CT check is often from the pubic symphysis to the level of the diaphragm continuous scan, the thickness is 8-12mm, with the development of technology, it adopts spiral scanning or TLC scanning. In order to maximize the discovery of metastasis of ovarian cancer, intravenous and a considerable amount of oral contrast agents are needed for checking CT. The appropriate amount of contrast agents can show the metastasis in liver and spleen parenchyma organ.

Table 1 The Comparison of Accuracy of CT and MRI on Ovarian Cancer Staging [Cases (%)]

Staging of operation cases	The number of cases	CT staging	MRI staging
Stage I	10	7(70.0)	8(80.0)
Stage II	14	10(71.4)	11(85.7)
Stage III	19	17(89.5)	16(94.7)
Stage IV	25	22(88.0)	23(96.0)
Total	68	56(82.4)	58(91.1)

CT findings of ovarian cancer metastasis is not the same. The parietal peritoneum metastasis showed irregular thickening, commonly in the right side and right anterior abdominal wall. Omental metastases always show diffuse and multiple soft tissue nodules or omental cake. The current CT scanning technology can not find out the metastasis omentum under microscope. Mesangial metastases always show soft tissue nodules in mesentery fat, while diffuse mesangial metastasis to the vasculature and fixation of small intestine mesentery are always in star shaped or reflective appearance.

It is difficult to find out the gastrointestinal serosa of ovarian cancer through CT, which is small planting foci commonly <5mm. When the transverse diameter is >1cm, the paraaortic lymph nodes should be highly considered as lymph node metastasis. In addition to liver metastasis, ovarian cancer can tend to transfer to the spleen, which often showed mixed cystic lesions. Low density peritoneal mucinous adenoma from metastases can be called as pseudomyxoma peritonei. Ovarian serous carcinoma can show calcified metastasis, extending to the peritoneal surface and mesenteric lymph nodes, because of the high density, it is easy to diagnosis by CT. Do not consider the filling gastrointestinal as calcific metastases. Implanted metastases of ovarian cancer can adopt the thin layer spiral CT to scan, especially on the upper part of abdomen, which can improve the accuracy; delayed scanning can help to detect out implanted metastases that can be larger than 2cm.

The Results of Clinical Case Analysis

The Age Distribution of Patients in the Initial Treatment.

The range of age is from 18 years old to 77 years old, the average age is 52 years old. Patients who are 50-59 years old rank the peak of the onset, accounting for 35.04%. Then patients who are 40-49 years old are in the second place, accounting for 26.5%. Patients who are 60-69 years old are decreased slightly, accounting for 21.37%. Patients who are younger than 39 years old and older than 70 years old are significantly reduced, accounting for 17.09%. See Fig. 1.

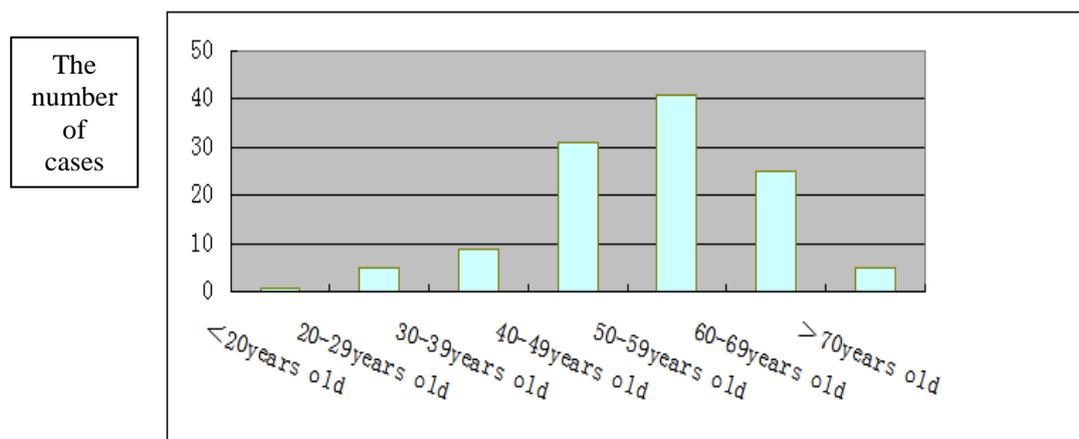


Fig. 1 Age Distribution of Ovarian Cancer Incidence

Table 2 The Circumstances of Clinical Manifestations

Clinical manifestation	The number of cases (cases)	The proportion (%)
Abdominal distention	72	61.54
Abdominal mass consciousness	46	39.32
Abdominal pain	33	28.21
Abdominal circumference is increased	25	21.73
The symptoms of urinary and bowel	18	15.38
Lose weight	10	8.62

CT Findings of Ovarian Cancer and Its Pathologic Basis.

The common CT findings and its pathological basis: the common CT findings of ovarian cancer are pelvic or abdominal mass, omentum like dirt cakes or nodular, ascites, peritoneal cavity. In this group, there are 54 cases with ovarian cancer, 48 cases (88.9%) showed pelvic or abdominal mass, while they are mostly with cystic mass, 23 cases (about 47.9%), there are cystic 18 cases (about 7.5%), there are nodules in the cystic wall or in the intracapsular septal; there are 7 cases with lesions (about 5.6%); there are 24 cases with ascites (about 57%). After enhanced scanning, the interval and the solid part can be enhanced obviously.

Ovarian cancer is usually derived from epithelial malignant tumor, the common pathological type is serous cystadenocarcinoma and mucinous cystadenocarcinoma. As for serous cystadenocarcinoma, the diameter of tumor can reach 50 cm, with smooth surface or papillary growth with the real cystic, necrosis, hemorrhage, and so on. As for mucinous cystadenocarcinoma, the diameter of tumor is from 15cm to 30 cm, the cystic wall can be seen with papillae or parenchyma. Under microscopically watching, the epithelial lining layer of cystadenocarcinoma is complicated with severe atypical hyperplasia. At the same time, the cystic wall is always covered with nipples, the branch of nipples are lush, cystic part secretion with the formation of cystic tumor or part of the tumor; in tumor, there are papillary clusters, each is bypassed or nipples are disappeared, which is composed of irregular solid sheets or strips of the nests, forming the part of solid mass or masses. Therefore, CT findings can show the features of omental mass and ascites or peritoneal thickening.

The Value of CT Prediction of Cytoreductive Surgery.

Most of the patients with malignant ovarian tumor was in the stage of III or VI, although it is late, the combination of cytoreductive surgery and postoperative chemotherapy can prolong survival period, the improvement of survival rate is depended on ideal cytoreductive surgery, the standard of successive cytoreductive surgery is the residual tumor without >2cm, which is similar to the complete tumor resection. Meyer and other people made analysis, among 28 cases of patients who had preoperative CT examination, by using five anatomic sites (liver, omentum, mesentery, para aortic lymph nodes, diaphragm) as the standard scoring system to predict surgical results, they found out that the omentum, liver and aortic lymph nodes, septum, pulmonary, mesenteric and bottom of lung with different degrees of ascites can be suitable for cytoreductive surgery, to determine the success of surgical treatment with this scoring system can show its sensitivity accounted for 58%, while specificity accounted for 100%. The limit is that not all the selected cases are in the late stage of the advanced ovarian cancer, the probability of the unnecessary surgery can be accounted for 45%.

Conclusion

CT can clearly display the anatomical structure of the pelvic organs, positioning accurately and making qualitative analysis for the part of of the tumor, which also can provide solid cystic features, clearly display the adjacent tissues of tumor invasion and lymph node metastasis. The combination of morphological examination by using radiographic study and the tumor marker examination with tumor molecular biological behavior can make people understand the correlation between morphological features of ovarian cancer and the malignant degree of ovarian cancer, which also can improve the level of diagnosing ovarian cancer.

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