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CYTOLOGICAL DETECTION OF TUMOUR DISSEMINATION IN COLORECTAL CANCER IN THE ABSENCE OF VISIBLE PERITONEAL NODULES

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Background. Detection of peritoneal involvement in colorectal cancer (CRC) requires correlation of imaging, intraoperative findings and pathological findings. According to the joint recommendations of ESGAR, ESUR, PSOGI and EANM, computed tomography (CT) may underestimate the extent of peritoneal metastases, particularly small implants and involvement of the bowel serosa and mesentery [1]. Likewise, the absence of macroscopically documented nodules at laparoscopy does not establish the cellular composition of any peritoneal fluid present. A previous publication by one of the authors addressed the clinical relevance of laparoscopy with peritoneal biopsy and lavage analysis when imaging findings are indeterminate [2]. Of particular interest is the diagnostic contribution of cytological examination of spontaneously occurring ascitic fluid collected during therapeutic laparoscopic surgery.

Objective. To present the findings of further diagnostic assessment in a case of CRC in which cytological examination of ascitic fluid identified tumour dissemination despite the absence of macroscopically documented peritoneal nodules.

Materials and methods. A retrospective description of a single de-identified clinical case was prepared using material from the dissertation entitled “The Role of Minimally Invasive Methods in the Diagnosis of Locally Advanced and Metastatic Colorectal Cancer”. The source was a discharge summary stored in the clinical database, which included preoperative CT findings, a description of the laparoscopic procedure, histopathology and cytology reports, and discharge recommendations. Three components of the diagnostic episode were compared sequentially: imaging findings, macroscopic assessment of the peritoneum, and cytological examination of the fluid. The primary descriptive outcome was the additional diagnostic information provided by cytology beyond visual inspection. Frequencies, sensitivity, specificity

and measures of treatment effectiveness were not calculated on the basis of a single case.

Results. Preoperative CT revealed a colorectal tumour, regional lymphadenopathy, signs of large bowel obstruction and a small amount of free fluid. Laparoscopic anterior resection of the rectum was performed the following day. During surgery, up to 300 mL of pale yellow ascitic fluid was aspirated and submitted for cytological examination. The operative report described the peritoneum as smooth and glistening, with no pathological lesions; no hepatic metastases were documented on visual inspection and palpation using laparoscopic instruments. Thus, the fluid was collected in the absence of a macroscopically identifiable peritoneal target for directed biopsy.

Histopathological examination of the resection specimen confirmed moderately differentiated rectal adenocarcinoma invading the surrounding adipose tissue, with metastases in 2 of 24 regional lymph nodes examined; the report recorded pT3 pN1b, G2. The resection margins, including the circumferential margin, were reported as negative. These findings characterise the primary tumour and regional involvement and are considered separately from the peritoneal fluid findings.

On postoperative day 4, the cytology report became available and described cellular findings consistent with dissemination of an adenocarcinoma. Accordingly, within a single diagnostic episode, a discrepancy was documented between the absence of macroscopically described peritoneal nodules and positive ascitic fluid cytology. This additional finding was obtained by examining material collected during an ongoing therapeutic laparoscopic procedure. The discharge summary recommended further assessment and systemic anticancer therapy under oncological supervision. This record does not establish that the cytological findings caused the treatment recommendation, nor does it confirm that the recommended therapy was actually administered.

Discussion. The original finding of this report is the documented additional diagnostic contribution of cytology in a specific clinical episode. Visual inspection described the condition of the surfaces examined, whereas cytology provided information on tumour cells in the fluid. A positive cytological result does not replace histological examination of a peritoneal implant and does not establish the Peritoneal Cancer Index. Similarly, the absence of visible nodules does not permit the cellular composition of the fluid to be retrospectively considered negative. No separate staging laparoscopy was performed in this case: the diagnostic component was incorporated into resection of the primary tumour.

Previously published series by the authors, each based on a defined sample, provide quantitative context. In the General Surgery article, peritoneal carcinomatosis was morphologically confirmed in 19 of 22 patients with suspected involvement (86.4%), and treatment strategy was changed after laparoscopy or mediastinoscopy in 29 of 37 patients (78.4%) [2]. In the Ukrainian Scientific Medical Youth Journal publication, which included 26 surgical episodes in 25 unique patients, the median length of hospital stay was 8.5 days following minimally invasive procedures and 10.5 days following open surgery; the difference was not statistically significant ($p = 0.289$) [3]. A study of surgical staging in locally advanced CRC examined the additional value of

minimally invasive verification in patients with indeterminate imaging findings [4]. These figures derive from the respective publications; they are not results of an analysis of the present case or of the dissertation cohort currently being expanded.

Hentzen et al. demonstrated the value of diagnostic laparoscopy in selecting patients with colorectal peritoneal metastases for cytoreductive treatment and reducing the rate of non-therapeutic laparotomy [5]. However, selection for such treatment and cytological verification of peritoneal fluid serve different purposes. The prospective multicentre study by Kobayashi et al. evaluated the prognostic significance of peritoneal cytology following curative resection of stage II–III CRC [6]. Its findings should not be directly extrapolated to the diagnostic accuracy of examining spontaneously occurring ascites in the present case.

Detection of tumour cells requires further correlation with other staging findings and multidisciplinary treatment planning. The ASCO guideline supports cytoreductive surgery combined with systemic therapy in selected patients in whom complete resection of peritoneal disease is feasible and who have no extraperitoneal metastases [7]. Therefore, confirmation of malignancy in a peritoneal specimen does not, by itself, determine resectability or dictate a single treatment option.

Limitations. This report describes a single case reviewed retrospectively. The available information does not allow assessment of the frequency of discordant findings, the diagnostic accuracy of cytology, the independent impact of this examination on treatment, or long-term outcomes. In the absence of histological examination of a peritoneal implant, the finding is limited to positive fluid cytology. Expansion of the overall dissertation database does not alter the description of this documented episode; however, generalisation to the cohort requires a separate analysis.

Conclusions. In the reported case, cytological examination of ascitic fluid collected during laparoscopic resection for CRC identified tumour dissemination despite the absence of macroscopically documented peritoneal nodules. This observation demonstrates the additional information provided by cytological examination beyond visual inspection and supports the need to distinguish between their findings when refining disease staging. The result relates to a specific clinical episode; its reproducibility and clinical significance at the cohort level require further investigation.

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