Rate of Appendiceal Metastasis with Non-Serous Epithelial Ovarian Cancer in Manitoba

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Abstract

Objective: This study sought to evaluate the rate of appendiceal involvement in non-serous mucinous and endometrioid-associated epithelial ovarian cancers.

Methods: The Manitoba Cancer Registry and CancerCare database were used to find all women with non-serous epithelial ovarian, fallopian tube, or primary peritoneal cancer between 1995 and 2011. All patients with an appendectomy were then identified, and their final pathology findings were reviewed. Women who did not receive treatment or lacked follow-up were excluded.

Results: We identified 338 patients from 1995–2011 with no prior appendectomy. Of these, 16.6% received an appendectomy, and 22.8% were clinically evaluated. Most cases within this cohort were mucinous (62%) and stage 1 (63%). Four appendiceal metastases were identified (7.2%), and one half appeared clinically normal at the time of surgery (3.6%). Within the mucinous histologic type, 32.7% of patients received an appendectomy, with a metastatic rate of 5.7%. Of the 127 endometrioid cases, only 10 patients received an appendectomy, and 2 were found to have metastases. No metastases were found in the 85 patients in the clear cell cohort, only 5 of whom received an appendectomy.

Conclusion: Routine appendectomy or clinical assessment of the appendix is valuable for all non-serous ovarian cancers. The rate of involvement for endometriosis-associated ovarian cancers may be significantly higher than expected, and further studies need to be conducted.

Key Words: Appendectomy, ovarian cancer, mucinous carcinoma, endometriosis-associated ovarian cancer

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Résumé

Objectif : Cette étude avait pour but d'évaluer le taux d'atteinte de l'appendice chez les femmes ayant un cancer épithélial de l'ovaire non séreux, mucineux ou endométrioïde.

Méthodologie : Nous avons mené des recherches dans le registre du cancer du Manitoba et la base de données d'Action cancer Manitoba pour recenser toutes les femmes qui ont reçu un diagnostic de cancer épithélial de l'ovaire non séreux, de cancer des trompes de Fallope ou de cancer primitif du péritoine entre 1995 et 2011. Toutes les patientes ayant subi une appendicectomie ont été recensées, et les résultats de leurs rapports de pathologies finaux ont été examinés. Les femmes n'ayant pas fait l'objet d'un traitement ou dont le suivi était insuffisant ont été exclues.

Résultats : Pour la période de 1995 à 2011, nous avons retenu 338 patientes n'ayant pas d'antécédents d'appendicectomie. Parmi celles-ci, 16,6% ont subi une appendicectomie et 22,8% ont fait l'objet d'une évaluation clinique. La plupart des cancers de cette cohorte étaient mucineux (62%) ou de stade 1 (63%). Quatre patientes ont eu des métastases à l'appendice (7,2%) et la moitié d'entre elles présentaient un tableau clinique normal au moment de la chirurgie (3,6%). Parmi les patientes atteintes d'un cancer mucineux, 32,7% ont subi une appendicectomie et 5,7% présentaient des métastases. Seulement 10 des 127 femmes atteintes d'un cancer endométrioïde ont subi une appendicectomie, et deux avaient des métastases. Aucune métastase n'a été détectée chez les 85 femmes atteintes d'un cancer à cellules claires; cinq d'entre elles ont subi une appendicectomie.

Conclusion : L'appendicectomie systématique et l'évaluation clinique de l'appendice présentent des avantages pour tous les cas de cancer de l'ovaire non séreux. Le taux d'atteinte de l'appendice chez les cas de cancer de l'ovaire endométrioïde pourrait être significativement plus élevé que prévu; d'autres études seront nécessaires.

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INTRODUCTION

Removal of an appendix during epithelial ovarian cancer (EOC) surgery has been argued to be useful for debulking and staging. In the case of surgical debulking, an appendectomy can easily be performed, thereby helping the surgeon achieve optimal cytoreduction, with appendiceal involvement found in up to 30% to 37% of cases.[1,2] By contrast, removal of the appendix for staging remains deeply controversial. Several studies examined removal of the appendix for EOCs and recommended its incorporation into standard staging or primary surgery,[1–5] whereas others considered that the risk of appendiceal involvement was too low and that appendectomy should not be the standard of care.[6–8] Although appendectomy is a relatively benign procedure, there are still potential complications including hemorrhage, peritonitis, development of an intra-abdominal abscess, intussusception, intestinal obstruction, and perforation.

Several early studies in EOC exhibited rates of appendiceal involvement ranging from 11% to 83%.[1,2,5,8–11] Most of these studies included all histotypes or did not specify histotype, identified a large group of patients with serous carcinoma, and confirmed that serous EOCs have a high rate of appendiceal involvement.[2,5,8,11,12] The largest study, by Ayhan et al.,[1] involved 285 patients who had undergone appendectomy with their initial surgical procedure. Overall, these investigators found an appendiceal metastatic rate of 37%, but 53% of their cohort had a serous histotype. These investigators found microscopic involvement in 25% of cases and recommended routine appendectomy.[1]

Teaching within gynaecology has generally recommended appendectomy for mucinous tumours.[13,14] This was initially believed to be done to rule out primary appendiceal disease that has metastasized to the ovary, especially in the setting of pseudomyxoma peritoneii.[15–18] This concept was further supported by Dietrich et al.,[19] who examined 48 women with primary appendiceal cancer. In this cohort, 65% had presented with a pelvic mass and were initially operated on by a gynaecologic oncologist; the ovarian involvement rate was 38%. Subsequently, several retrospective studies examined the role of appendectomy in mucinous ovarian tumours including invasive tumours,[7,20,21] tumours with low malignant potential,[7,20,21] and benign tumours.[20] Most of these investigators believed that appendectomy was not necessary in patients with a normal-appearing appendix.[7,20,21] However, Rosendahl et al.[3] reviewed 269 patients with mucinous ovarian carcinoma to examine the effects of appendectomy on survival.[3] Appendectomy was performed in 172 cases, with 10 cases of metastatic disease. These investigators found that patients who underwent appendectomy had improved 5-year and overall survival rates and recommended that appendectomy be performed for complete staging and improved outcomes.

Endometriosis is known to involve the appendix in 3.7% to 49.8% of cases,[22–24] but very little research has been performed on endometriosis-associated ovarian cancers (EAOCs), specifically endometrioid and clear cell EOCs. Several larger retrospective studies have included EAOC within their cohorts. The best estimate from these studies is that the appendix is involved 17% to 36% of the time.[1,8,10] From our review of the literature we did not identify the rate of appendiceal metastasis in non-serous EOCs, especially in EAOC.

Although the largest studies have focused on serous EOCs, the literature on non-serous EOCs has included several studies of mucinous tumours, but a lack of studies of EAOCs. The objective of this retrospective cohort study was to determine the rate of appendectomy and appendiceal metastasis in Manitoba with respect to all non-serous EOCs. If the appendix is identified as a possible metastatic site, it is hypothesized that routine removal of the appendix at the time of staging surgery could lead to upstaging of the cancer or possibly confer a survival benefit to patients.

METHODS

This retrospective cohort study was approved by the University of Manitoba Research Ethics Board (REB # H2015:062 (HS18503) and by CancerCare Manitoba (RRIC #2015-008). Funding was provided by the University of Manitoba Department of Obstetrics, Gynecology and Reproductive Sciences Resident Research Fund.

Data from the Manitoba Cancer Registry was used to extract the non-serous cancer cohort, as well as the demographic, diagnostic, treatment, and death information. Clinical information and personal histories were extracted by chart review from the CancerCare Manitoba patients' charts. The database contained anonymized personal health identification numbers, age, past medical history including history of previous surgical procedures, diagnosis, histologic features, grade of cancer, stage, surgical procedure performed, appendectomy, and appearance and pathologic features of the appendix. To answer our research question, we used the type of cancer, stage, appearance of appendix at the time of surgery, and pathologic features of the appendix.

All women of any age with known non-serous epithelial ovarian, fallopian tube, or primary peritoneal invasive cancers