Multicystic peritoneal mesothelioma treated with cytoreductive surgery followed or not by hyperthermic intraperitoneal chemotherapy: results from a large multicentric cohort

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ABSTRACT

Background: Multicystic peritoneal mesothelioma (MCPM) is a rare, slowly growing, condition prone to recur after surgery. The role of hyperthermic intraperitoneal chemotherapy (HIPEC) added to complete cytoreductive surgery (CRS) remains controversial and difficult to assess. As patients are mostly reproductive age women, surgical approach, and fertility considerations are important aspects of the management. This observational retrospective review aimed to accurate treatment strategy reflections.

Methods: The RENAPE database (French expert centers network) was analyzed over a 1999–2019 period. MCPM patients treated with CRS were included. A special focus on HIPEC, mini-invasive approach, and fertility considerations was performed.

Results: Overall 60 patients (50 women) were included with a median PCI of 10 (4–14) allowing 97% of complete surgery, followed by HIPEC in 82% of patients. A quarter of patients had a laparoscopic approach. Twelve patients (20%) occurred with a 3-year recurrence free survival of 84.2% (95% confidence interval 74.7–95.0). The hazard of recurrence was numerically reduced among patients receiving HIPEC, however, not statistically significant (hazard ratio 0.41, 0.12–1.42, p = 0.200). A severe post-operative adverse event occurred in 22% of patients with five patients submitted to a subsequent reoperation. Among four patients with a childbearing desire, three were successful (two had a laparoscopic-CRS-HIPEC and one a conventional CRS without HIPEC).

Conclusion: MCPM patients treatment should aim at a complete CRS. The intraoperative treatment options as laparoscopic approach, fertility function sparing and HIPEC should be discussed in expert centers to propose the most appropriate strategy.

Introduction

The term ‘multicystic peritoneal mesothelioma’ (MCPM) was introduced in 1979 by Mennemeyer and Smith [1] after its macroscopic description by Plaut in 1928 [1]. The long delay before the pathologic characterization could be explained by the extremely low incidence of this disease. While peritoneal mesothelioma affects 1–2 cases/million/year, MCPM accounts for 3–5% of these cases and affects mainly women in reproductive age with a sex ratio of 4.7:1 [2–4]. The diagnosis is usually incidental or secondary to unspecific abdominal symptoms, rarely during an infertility work-up [5–7]. Computed tomography scanner and magnetic resonance imaging (MRI), classically allow MCPM diagnosis when pathognomonic multifocal multicystic lesions as bunches of grapes are present [8,9].

Typical MCPM histology harbors border-line signs with a lack of cellular atypia or increased number of mitoses; however, squamous cell metaplasia is possible [10,11]. Lesions...
are made of small cysts with benign mesothelial epithelium appearing cuboidal cells occasionally forming papillae. Between the cysts, the stroma is characterized by variable degree of inflammation. Sometimes combined endometriosis lesions are found, fueling the theory of a chronic peritoneal irritation pathogenesis [12]. The pathological differential diagnoses include a number of benign and malignant lesions presenting as multicystic abdominal masses and are usually clarified with immunohistochemistry [2,4,13]. The particular epidemiologic characteristics of MCPM patients when compared to malignant mesothelioma patients – young women without history of mineral fiber exposition – suggest an independent pathogenesis. However, nor the hormonal, nor the repetitive peritoneal irritation theories have been decidedly established [11,12,14–16].

Two features of MCPM should guide the therapeutic strategy: the high recurrence rate after surgery, estimated up to 50% [17,18] and the rare eventuality of malignant transformation despite its slow growing course [11,19–22]. It is justified not to classify MCPM as a ‘benign’ disease but as a borderline disease. Several therapeutic strategies have been proposed but comprehensive cytoreductive surgery (CRS), typically followed by an hyperthermic intraperitoneal chemotherapy (HIPEC), has been reported to be associated with the best long-term outcomes [5,23,24]. This invasive treatment has recently been advocated by international clinical guidelines, as a front-line treatment for the Peritoneal Surface Oncology Group International (PSOGI) and after an observation period in case of symptoms or progression for the Chicago Consensus Working Group [4,25]. Therefore, the first paradigm of MCPM is to proceed to an invasive treatment considering its loco-regional recurrence risk, despite its slow growing rate. The second is the confrontation between a childbearing desire and a CRS-HIPEC indication prone to decrease fertility, raising the question of less invasive strategies.

RENAPE is a French network of peritoneal surface malignancies centers that maintains a dedicated database. The present report is an observational retrospective review of a large cohort of MCPM patients treated by CRS followed or not by HIPEC, with a focus on post-operative results, the role of mini-invasive approaches, and fertility considerations, aiming at give insights for tailoring therapeutic strategies.

Materials and methods

The RENAPE observational registry

The French peritoneal surface malignancies centers network RENAPE was set up to harmonize therapeutic strategies and enhance collaborative research projects to overcome the challenge of rare conditions [26]. An annual meeting allows to discuss current issues, to coordinate clinical studies and to find an agreement on main therapeutic strategies. Regional monthly multidisciplinary team meetings are held to decide rare peritoneal disease cases treatment strategies. The cornerstone of that work is the RENAPE database, prospectively collected from 2010 and enriched by retrospective inclusion of cases treated before that date (ClinicalTrials.gov identifier: NCT02834169). All cases reported as MCPM were extracted from the RENAPE registry as of December 2019 [27]. The following inclusion criteria were then applied: having received at least one CRS in a RENAPE center and having a sufficient amount of data for analysis including: diagnosis circumstances, surgery details, HIPEC parameters, post-operative complications description and a postoperative follow-up longer than 6 months. A group of expert pathologists (RENA-PATH group) together with a group of expert radiologists (RENA-RAD group) reviewed these selected cases to validate the diagnosis and, when needed, the recurrence status. The aim was to discriminate differential diagnosis such as isolated mesothelial cyst, endometriosis or postoperative features rather than recurrences. Data quality was assured by pretesting and consistency checks during data entry, when applicable [27]. The RENAPE Observational Registry complies with the ethical principles laid down in the Declaration of Helsinki and has been approved by the Advisory Committee for Data Processing in Health Research at the Research French Ministry (CCTIRS – no. 10.257).

Diagnosis and preoperative workup

A tissue biopsy obtained along staging laparoscopy or by interventional radiology allowed the histologic diagnosis. Curative intent treatment was preceding by a morphological assessment including at least an injected computed tomography scanner. The strategy was validated in RENAPE multidisciplinary meeting.

From 2009, a laparoscopic approach was considered for low grade peritoneal disease, depending on following criteria: American Society of Anesthesiologists score of less than 2, limited carcinomatosis on preoperative workup with a Sugarbaker’s Peritoneal Cancer Index (PCI) [28] estimated at 10 or less, and a limited history of abdominal surgery (only two abdominal regions dissected) [29]. If laparoscopic approach was considered, the workup was completed by a peritoneal MRI and a staging laparoscopy to define more accurately the disease extent and confirm the feasibility of the mini-invasive strategy. Of note, in results, a laparoscopic procedure designated only those performed without conversion to laparotomy.

Treatment and operative outcomes

The operation included a comprehensive abdominal exploration, then peritonectomies and organ resections, performed as described previously [30,31]. The PCI and the completeness of cytoreduction score (CC-score) [28] were reported along with all HIPEC parameters (drug(s), concentration, duration, temperature). A CC-score of 0 was scored in the absence of macroscopic residual disease at the end of CRS corresponding to a complete CRS, while CC-1 meant the persistence less than 2.5 mm nodules [28].

Post-operative adverse events were recorded over the 90 postoperative days following CRS and graded according to the CTCFAE v5.0 classification [32]. Patients were followed-up at least every 6 months with physical exam and abdomino-
pelvic computed tomography scanner or peritoneal MRI. Recurrences were declared in RENAPE multidisciplinary meeting on the basis of histology and/or morphological assessment including a MRI.

**Fertility considerations**

With the aim to evaluate MCPM treatment impact on fertility, a specific analysis was performed on women of less than 40 years at the time of diagnosis. A survey was built up and those patients were given a phone call to investigate an eventual child bearing desire, assisted reproductive technology intervention, and fertility outcomes after the CRS.

**Statistical analysis**

Proportions were calculated for categorical data, whereas median and interquartile range (IQR) were calculated for continuous data. Statistical significance for categorical data was assessed using a $\chi^2$ test or a Fisher test, as appropriate. Survival probabilities were estimated using the Kaplan–Meier estimator. A comparison of severe postoperative complications (grades 3–5) incidence between patients treated with laparoscopic approach and others was performed. Recurrence-free survival was calculated from the date of surgery to the diagnosis of a recurrence or death. Recurring patients data were independently analyzed.

**Results**

**Study population**

The flowchart is shown in Figure 1. Over 1035 mesothelioma patients, 92 patients were referenced with MCPM in the RENAPE registry, of which 29 were excluded for insufficient data to perform a comprehensive analysis. Of note, two patients with uncommon pathology, initially diagnosed as MCPM were confirmed as malignant mesothelioma after expert reviewing. After histologic and radiologic reviewing of the remaining 63 patients, 3 patients were further excluded for the impossibility to confirm the MCPM diagnosis. The 60 included patients were treated in 11 RENAPE centers (85% in 5 units). Diagnoses were made between June 1999 and September 2019, 83% of them after June 2011. The median follow-up time was 42.8 months (95%, confidence interval (CI) 35.9–54.3).

Main patients characteristics are described in Table 1. The population exhibited a majority of women with a sex ratio of 5:1 and a median age at diagnosis of 45 years [31–55]. As expected, no history of mineral fibers exposition was encountered. Infertility was not reported as a revealing modality. The principal diagnostic circumstances were incidental findings or abdominal pain exploration, in 39% and 47% of patients, respectively. Serum tumor markers were normal. Unfortunately, data regarding history of abdominal surgery, endometriosis, and inflammatory bowel disease were insufficiently collected to be analyzed.

Figure 1. Flowchart of the multicystic peritoneal mesothelioma population. MCPM: multicystic peritoneal mesothelioma; CRS: cytoreductive surgery; HIPEC: hyperthermic intraperitoneal chemotherapy.
MCPM treatment with CRS ± HIPEC

The treatment parameters and outcomes are reported in Table 2. Seventeen percent of patients had a history of previous CRS outside of the referral center while one received a systemic pre-operative chemotherapy. The median PCI was 10 (4–14) allowing 97% of complete surgery. The median cytoreduction time was 242 min (210–300). CRS was followed by HIPEC in 82% of patients with cisplatin–doxorubicin being the most frequent intraperitoneal drugs used. From June 2009, a laparoscopic approach was used in 15 patients (25%), who presented a median PCI of 4.0 (3.0–5.0). A majority of these laparoscopic CRS (87%) were performed in one center.

Oncologic outcomes

No patients died during the follow-up period while 12 (20%) recurred with a median recurrence-free survival time of 9.1 years (95% CI, 9.1 months – not reached) with a 3-year recurrence-free survival of 84.2% (74.7–95.0) as displays Figure 2. A focused analysis of those 12 patients is presented in Table 3 and showed that their median PCI was 11 (6–15.5) and that 2 (17%) had a CC-1 resection but none of them was operated with a laparoscopic approach. Of note, 4 of them (33%) did not receive HIPEC, while HIPEC was omitted in 9 out of the 48 non-recurrent patients (15%). The overall hazard of recurrence was reduced among patients receiving HIPEC (hazard ratio (HR) of recurrence 0.41, 95% CI, 0.12–1.42, \( p = 0.200 \)). Two patients presented a delayed recurrence, 50.8 and 109.6 months after CRS, respectively.

Post-cytoreduction outcomes

The median length of hospital stay was 14.0 days (11.0–16.2) and 9.0 days (7.2–11.7) for patients treated with a laparotomy or a laparoscopic approach respectively (\( p < 0.001 \)). No patients died within the 90 postoperative days. Overall 13 patients (22%) presented 15 severe post-operative adverse events. In particular, five patients (8%) were submitted to a subsequent surgery for an intraabdominal abscess, two eviscerations, and one digestive fistula (Table 2). All postoperative hemorrhages were manageable medically. One patient treated laparoscopically presented a severe complication (wall abscess), which was proportionally less than for patients treated by laparotomy (7 versus 27%, respectively, \( p = 0.130 \)).

Fertility considerations

Table 4 summarizes the outcomes of the 18 MCPM female patients younger than 40 years at diagnosis. Five (28%) had at least one successful pregnancy before surgery and 4 (22%) had a history of gynecologic surgery. One-third of these patients had a pre-operative fertility counseling which was proposed as a systematic center policy that led two patients to proceed to an oocytes cryopreservation. The median PCI of these 18 women was 6 (4–10) with 10 women (56%) presenting with pelvic lesions. The cytoreduction was performed laparoscopically in 8 (44%), including a bilateral adnexectomy in 3, and was followed by HIPEC in 14 (78%). Of the 15 patients with at least one remnant ovary: all had CC-0 CRS, 11 had HIPEC, and 2 had a recurrence at 6.2 and 14.5 months after CRS without HIPEC. Regarding the 10 patients with pelvic disease: 7 kept at least one ovary and the same 2 patients, with both ovaries in place, recurred.

Data regarding fertility were accurate in 15 patients and 4 reported a desire for pregnancy during the postoperative period. Three of them successfully had a child after vaginal delivery, including 1 requiring assisted reproductive intervention. Among those four patients, three had a laparoscopic-CRS-HIPEC (including the one with no pregnancy) and one had a conventional CRS without HIPEC.

Discussion

This RENAPE registry analysis confirmed the favorable long-term outcomes obtained with CRS, usually followed by HIPEC, in MCPM patients with a relatively low recurrence rate and an acceptable safety profile. Based on strict selection criteria, the laparoscopic approach was not followed by any recurrence. All together, these results enhance the role of expert centers to manage such rare peritoneal disease.

The retrospective nature of the data collection over a large period jeopardized relevant statistical comparison but, considering the extreme rarity of the disease, no other method was applicable. It appears clearly that the main issue of MCPM patients is rather avoiding loco-regional
recurrences and limiting treatment-related severe toxicities than overall survival.

Thanks to a multicentric national collaboration, RENAPE was able to present a large cohort helping at the assessment of CRS-HIPEC as first-intended treatment of MCPM patients. Thus, the recurrence hazard was numerically reduced among patients receiving HIPEC (HR 0.41, 0.12–1.42, p = 0.200). These outcomes were consistent with the main series from literature [5,23,24]. Historic series, where patients were mainly treated by surgery alone (sometimes also with radiation or systemic chemotherapy) mentioned recurrences in half of patients with a mean interval of 32 months[10,11,17]. Conversely in more recent series using CRS-HIPEC, recurrence rates were around 20% of patients like in the present one [5,24]. Some insights in the literature also suggested that an early radical intervention could decrease the recurrence rate: Baratti et al. [6,7] found that recurrence-free survival following previous debulking surgery was statistically worse than recurrence-free survival after upfront CRS-HIPEC.

These results plead in favor of adding HIPEC to CRS but there is still a debate regarding the frontline therapeutic strategy for asymptomatic patients with low disease burden. Two alternatives appeared in the recent clinical guidelines produced by the PSOGI and the Chicago Group: either a frontline intervention (without emergency) encouraging the addition of HIPEC, or an intervention at the time of a

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**Table 2. Treatment-related data.**

| Treatment characteristics | Overall population (n = 60) | Relapse (n = 12) |
|---------------------------|----------------------------|----------------|
| History of CRS before the expert center referral\(^a\) (NA = 2) | 10 (17%) | 3 (25%) |
| Pre-operative chemotherapy\(^*\) (NA = 2) | 1 (2%) | 0 (0%) |
| Post-operative chemotherapy\(^a\) | 0 (0%) | 0 (0%) |
| Laparoscopic approach\(^*\) (NA = 2) | 15 (25%) | 0 (0%) |
| PCI\(^b\) (NA = 3) | 10 (4–14) | 11 (6–15.5) |
| Completeness of CRS score\(^a\) (NA = 0) | CC–0 | 58 (97%) |
| | CC–1 | 2 (3%) |
| | Splenectomy\(^a\) (NA = 3) | 3 (5%) | 0 (0%) |
| HIPEC\(^*\) (NA = 0) | Yes | 49 (82%) |
| | No | 11 (18%) |
| HIPEC drug\(^a\) (NA = 1) | Cisplatin–doxorubicin | 27 (55%) |
| | Cisplatin–mitomycin | 4 (8%) |
| | Cisplatin alone | 3 (6%) |
| | Oxaliplatin–irinotecan | 6 (12%) |
| | Oxaliplatin alone | 8 (16%) |
| Length of CRS before HIPEC in minutes\(^b\) (NA = 13) | 242 (210–300) | 225 (198–285) |
| Length of ICU stay in days\(^b\) (NA = 7–5) | 1 (1–3) | 1 (0–1) |
| Length of hospital stay in days (NA = 7–5) | 12.5 (10.3–15.8) | 14 (13.5–20) |
| Postoperative results\(^a\) | Severe post-operative complications (NA = 4) | 13 (22%) |
| | Hematologic | 3 (5%) |
| | Cardiovascular | 0 (0%) |
| | Fever | 1 (2%) |
| | Surgical | 8 (13%) |
| | Intraabdominal abscess | 1 (2%) |
| | Wall abscess | 1 (2%) |
| | Evisceration | 2 (3%) |
| | Digestive fistula | 1 (2%) |
| | Hemorrhage | 3 (5%) |
| | Respiratory | 2 (3%) |
| | Renal | 1 (2%) |
| | Re-intervention | 5 (8%) |
| | Post-operative death | 0 (0%) |
| | Severe post-operative complications according to the surgical approach (NA = 0) | Laparotomy | 12 (27%) |
| | Laparoscopy | 1 (7%) |
| \(p\) (Fisher test) | 0.13 |

\(^a\)\(N\) (%). \(^b\)Median (interquartile range).

NA: data not available; CRS: cytoreductive surgery; PCI: peritoneal carcinomatosis index; HIPEC: hyperthermic intraperitoneal chemotherapy; ICU: intensive care unit.
Table 3. Recurrent patients clinical details.

| Patient number | Sex  | Age at diagnosis (y) | PCI  | CC-score | HIPEC (Y/N) | HIPEC drug(s) | Laparoscopy | Recurrence delay (m) |
|----------------|------|----------------------|------|----------|-------------|---------------|-------------|----------------------|
| 1              | F    | 83                   | 2    | 0        | N           |               |             |                      |
| 2              | M    | 23                   | 15   | 0        | Y           | Cisplatin–doxorubicin | N           | 19.9                 |
| 3              | F    | 64                   | 2    | 0        | N           |               | N           | 109.6                |
| 4              | M    | 61                   | 25   | 0        | Y           | Cisplatin–mitomycin | N           | 16.6                 |
| 5              | F    | 41                   | 13   | 0        | Y           | Cisplatin–doxorubicin | N           | 30.4                 |
| 6              | F    | 60                   | 11   | 0        | Y           | Cisplatin     | N           | 13.8                 |
| 7              | F    | 42                   | 11   | 0        | N           |               |             | N                    |
| 8              | F    | 44                   | 10   | 0        | Y           | Cisplatin–doxorubicin | N           | 36.0                 |
| 9              | M    | 18                   | 16   | 0        | Y           | Cisplatin–doxorubicin | N           | 22.2                 |
| 10             | F    | 20                   | NA   | 1        | Y           | NA           | N           | 50.8                 |
| 11             | F    | 21                   | 2    | 0        | N           |               | N           | 14.5                 |
| 12             | F    | 41                   | 24   | 1        | Y           | Oxaliplatin   | N           | 35.2                 |

Total: F: 9 (75%)^a 41.5 (22.5–60.3)b 11 (6–15.5)b CC-1: 2 (17%)^a N: 4 (33%)^a 9.1 years

Non-recurrent population: F: 41 (85%)^a 44.0 (31.0–49.3)b 10 (4.3–13)b CC-1: 0 (100%)^a N: 9 (15%)^a

M: male; F: female; PCI: peritoneal carcinomatosis index; CC-score: completeness of cytoreduction score; HIPEC: hyperthermic intraperitoneal chemotherapy; m: months; NR: not reached.

^aN (%).

^bMedian (interquartile range).

Despite a consistent follow-up, no transformation into malignant mesothelioma was found here while several cases were reported in the literature with histologic transition along repetitive CRS [19–22]. Some patients have also been described as MCM with malignant contingent [34]. Thereby and given the delayed recurrences observed (at 51 and 110 months), a prolonged follow-up is justified for these patients. MRI, accurate to characterize MCM lesions and avoiding radiation exposure of Computed Tomography scanner, appears as a suitable imaging modality [9,35]. A two-yearly basis from the third postoperative year should probably be recommended to detect treatable recurrences [18].

Severe post-operative adverse events occurred in 22% of the patients in the present cohort, with 8% submitted to a secondary surgery but no postoperative death. These results are consistent with the median PCI of 10 and the corollary resections needed to achieve CC-0 cytoreduction. In the literature, this rate of severe adverse events varied from 7% to 60% of MCM patients submitted to CRS-HIPEC [4]. Interestingly, the sub-population treated with a laparoscopic approach, selected on the basis of strict criteria, exhibited a lower incidence of severe complications with the absence of recurrence, even if the frame of that study does not allow definitive conclusions. Laparoscopic CRS in the context of peritoneal metastases is a complex topic, rapidly evolving [36–39]. The risk of underestimating the PCI by laparoscopy, and potentially jeopardizing the completeness of CRS justifies a balanced patients selection to take advantage of this approach [38–40]. In this series the median PCI of patients treated laparoscopically was 4.5 (3.0–5.5), considerably lower than the one of the full cohort, which was probably the main reason explaining the excellent postoperative outcomes of this operative strategy.

A major advantage of the laparoscopic approach could be the fertility preservation. Data on peritoneal surface malignancies and fertility are scarce and made of retrospective reports, most of them related to pseudomyxoma peritonei (PMP) [41–44]. In the RENAPE database, the specific survey...

Table 4. Fertility issue in MCM women of less than 40 years old.

| Parameters | N = 18 |
|------------|--------|
| Age at diagnosis | 27.5 (22.5–31) |
| Pre-operative pregnancy | (NA = 1) |
| History of gynecologic surgery | 4 (22%) |
| Abdominal pain as clinical presentation | 7 (39%) |
| Laparoscopy | 8 (44%) |
| Pelvic lesions | 6 (4–10) |
| CRS including adnexectomy | 10 (56%) |
| CRS including hysterectomy | 3 (17%) |
| HIPEC | 3 (94%) |
| HIPEC | 1 (6%) |
| HIPEC | 2 (50%) |
| HIPEC | 2 (50%) |

NA: data not available; PCI: peritoneal carcinomatosis index; CC-score: completeness of cytoreduction score; HIPEC: hyperthermic intraperitoneal chemotherapy.

^aMedian (interquartile range).
performed in women of less than 40 years at diagnosis revealed that none had preoperative infertility and four had an assumed postoperative child desire. Three of them had a child, one after in vitro fertilization. The remaining women were expecting pregnancy for less than one year. Looking at the submitted treatment for MCPM showed that three had a laparoscopic-CRS-HIPEC (including the not answered one) and one had a conventional CRS without HIPEC. In literature, two pregnancies in the same patient were reported synchronously to a MCPM diagnosis (and three others in PMP patients) with vaginal delivery of two well children [42,43].

Regarding the impact of CRS-HIPEC on the reproductive function, multiple parameters could presumably interfere. First is the risk of ovarian involvement and the question of the benefit of a systematic bilateral salpingo-oophorectomy which is matter of debate, especially when considering a borderline disease [45]. MCPM was described to follow the redistribution phenomenon [46]. As so, the pelvic region is almost always involved even with low PCI. Regarding the 10 patients of less than 40 years with pelvic disease, 7 kept at least one ovary and 2, with both ovaries in place, recurred after CRS without HIPEC. Only one of them expressed a child desire and had a successful pregnancy.

Different strategies could be proposed to spare the reproductive function [41]. In the case of obvious ovarian invasion, ovarian sparing must include preoperative counseling and informed consent [4]. In the case of extensive peritoneal adhesions, ovarian sparing does not prevent postoperative subsequent infertility [47]. The role of HIPEC is difficult to clarify despite several studies showing that pregnancies following CRS-HIPEC are feasible and probably underestimated [41,47]. That suggests that heat and drug toxicities on ovarian function are relatively low. The key component of the proper management of such patients is to deliver balanced information regarding prognosis and fertility in the context of poor retrospective data.

Our study presents several limitations due to its retrospective nature with diagnosis performed over 20 years. Despite the expertise sharing through multidisciplinary and regional meetings, a certain degree of variation in treatment strategies depleted the value of outcomes comparisons.

Conclusions

Usually revealed as an incidental finding, the MCPM diagnosis is not difficult. Determining the most appropriate treatment strategy is more challenging considering its high recurrence rate, the potential malignant transformation and the aim of a low-impact treatment in childbearing age women. Complete CRS is the advocated treatment with a potentially lower risk of recurrence when followed by HIPEC. That treatment was feasible by laparoscopic approach in selected patients. In any case, MCPM patients should be referred to expert centers.

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