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**Management strategies for patients with advanced rectal cancer and liver metastases using modified Delphi methodology: results from the PelvEx collaborative**

*PelvEx Collaborative*

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## **Abstract**

**Background:** A total of 15-20% of patients with rectal cancer patients have liver metastases on presentation. The management of these patients is controversial. Heterogeneity in management strategies is considerable, and often dependent on local resources and available expertise.

**Methods:** members of the *PelvEx Collaborative* were invited to participate in the generation of a consensus statement on the optimal management of patients with advanced rectal cancer with liver involvement. Fifteen statements were created for topical discussion on diagnostic and management issues. Panellists were asked to vote on statements and anonymous feedback was given. A collaborative meeting was used to discuss any nuances and clarify any obscurity. Consensus was considered when >85% agreement on a statement was achieved.

**Results:** a total of 135 participants were involved in the final round of the Delphi questionnaire. Nine of the fifteen statements reached consensus regarding the management of patients with advanced rectal cancer and oligometastatic liver disease.

Routine use of MRI Liver was not recommended for patients with locally advanced rectal cancer, unless there was concern for metastatic disease on initial Computed Tomography

staging scan. Induction chemotherapy was advocated as first-line treatment in those with synchronous liver metastases in locally advanced rectal cancer. In the presence of symptomatic primary disease, a diverting stoma may be required to facilitate induction chemotherapy. Overall, only one-quarter of the panelists would consider simultaneous pelvic exenteration and liver resection.

**Conclusion:** this Delphi highlights the diverse treatment of advanced rectal cancer with liver metastases and provides recommendations from an experienced international group regarding the multidisciplinary management approach.

## **Introduction**

The management of metastatic rectal cancer has evolved significantly over the last two decades [1-2]. Historically, surgical resection in patients with advanced rectal cancer has been confined to those without extra-pelvic metastatic disease [3]. However, emerging evidence shows a survival benefit in selected patients that undergo resection of oligometastatic liver disease [4]. Patients with colorectal cancer who present with or develop metastatic disease can be divided into two management groups [5], those considered resectable or potentially resectable after conversion therapy, and those with definitively unresectable disease for whom a palliative approach is most appropriate [6]. Better staging and use of induction chemotherapeutics have helped risk stratify patients into those with good and bad cancer biology subgroups, but this is an imperfect process [7] and debate continues regarding the optimal management sequence and aggressiveness of surgery [8]. Although, synchronous locally advanced rectal cancer with liver metastases is associated with worse prognosis, long-term cure is still possible in selected patients with five-year survival rates of 30-50% reported in several small series [9-12].

Most published studies that have addressed management of colorectal liver metastases are of heterogenous groups combining colonic and rectal neoplasms in one entity [8, 13-14]. In addition, there are few data pertaining to resection of colorectal liver metastases in the setting of locally advanced colorectal cancer invading other pelvic organs. Simultaneous resection

has been sporadically reported, especially when technically feasible (low-volume, favourable disease), in patients that have good performance status [15]. However, to-date, there is no international consensus or guidance on the optimal management of these complex cases. . The aim of this study was to develop an international consensus on the management of advanced rectal cancer with synchronous liver metastases using a modified Delphi consensus methodology in the hope that this might help improve patient outcomes. pic.

## **Methods:**

A Delphi study was conducted to seek international opinion and consensus on the role of pelvic exenteration and simultaneous liver resection in the setting of advanced rectal cancer with synchronous liver metastasis. This process took place from March to August 2019. Those sampled were specialist colorectal/surgical oncology surgeons/physicians from thirty-one countries across six continents. All participants are members of the *PelvEx Collaborative*, established in 2015 to provide large-volume ‘real-world’ data to ascertain factors associated with outcomes following exenterative surgery. The collaborative is open to any institution/unit that provides a tertiary referral service and care for the management of advanced pelvic cancer[16-17].

### *Study Questionnaire*

The study questionnaire was generated using statements that reflected recent publications and recommendations. Initially, there were eleven questions with an option for participants to suggest further pertinent questions that could be included in subsequent rounds.

Respondents completed the online questionnaire via TypeForm® survey website for all four rounds of the Delphi process. A completion date for each round was set and an email reminder was sent to remind non-responders. The first round of the questionnaire assessed surgical preferences and practices regarding management of advanced pelvic cancer necessitating pelvic exenteration in the setting of oligometastatic disease. It was conducted

from 21 March to 19 April 2019. Consensus was considered significant if there was >85% preference for a particular choice. Statements that had <40% preference were not continued into the next round. Subsequent questions were modified to reflect prior round voting, with feedback of choices and removal of low ranked options.

Participants were again invited to partake in round 2. Three new questions were added from participant suggestions after the round 1 voting. Email reminders were again sent to encourage completion. The second round of the questionnaire was conducted from 28 April to 10 May 2019. A process as outlined above was again performed. The third round of voting took place prior to the international *PelvEx Collaborative* meeting in Dublin in June 2019 at which the results were discussed. Subsequently a final round of online voting (9 to 19 August 2019) was performed, to reflect discussions at the meeting.

### **Results:**

In total, 172 surgeons were invited to participate. 149 responded to round 1 (86.6%), with 143 (83.1%) and 140 (81.4%) responding to rounds 2 and 3 respectively. At the international collaborative meeting, 96 participants discussed results of rounds 1-3 voting. After dissemination of meeting discussions, the final round of voting had 135 participants.

#### *Rounds 1 - 3*

In Round 1, of the eleven statements, there was no consensus regarding any item. Low ranking options were removed, with three new questions added. Round 2 had no consensus over 85%, however six statements had >75% preferences. Again, low ranking options were removed and results disseminated to participants. Round 3 observed consensus (>85%) in six statements.

#### *PelvEx Collaborative Meeting and Final Round*

The *PelvEx Collaborative* meeting facilitated discussion regarding the nuances of each of the statements and clarified language issues and/or management options. Feedback from this meeting was distributed to all panellists. The final round (Round 4) observed consensus (>85%) in nine of fifteen statements (Table 1).

**Discussion:**

The stimulus for this modified Delphi consensus was to address the global differences surrounding the management of colorectal liver metastases in the setting of advanced rectal cancer. To date, the management of advanced rectal cancer with liver metastasis is very variable, [18-19]. Many patients undergo palliative treatment without being discussed at an advanced cancer multidisciplinary meeting [20]. Patients presenting with synchronous liver metastasis in the setting of advanced rectal cancer have less favourable cancer biology and poorer survival than those with metachronous liver metastasis. This view is overwhelmingly supported by this Delphi questionnaire. Nevertheless, the referral of these patients for a second opinion at a tertiary unit with specialised input can help select those in whom surgical resection is feasible, with acceptable morbidity, mortality and survival benefit [4, 21]. This modified Delphi questionnaire highlights the nuances and the need for a tailored approach. The routine use of MRI liver in patients with locally advanced rectal cancer is not advocated with a consensus that it should be reserved for those with suspicious abnormalities on CT-TAP. Similarly, there was no consensus that PET-CT should be performed prior to considering pelvic exenteration on patients with liver metastases. However, a major cofounder is the ready availability of MRI Liver and PET-CT at different institutions. Many centres only perform these routinely when involved in a clinical trial. Interestingly, one-fifth of panellists thought that PET-CT rarely influences surgical planning.

There was consensus that induction chemotherapy should be offered to patients and this reflects recent literature [22-24]. In the setting of symptomatic disease such as obstruction or fistulation due to local invasion, the majority recommended a diverting stoma before commencing chemotherapy on the basis that this might downstage non-resectable or borderline resectable tumours and increase R0 resection margin rates [25-26]. Additionally, a diverting stoma was indicated in those patients with adverse tumour biology in whom it was considered that disease progression was inevitable during therapy. [27].

This study found that only 25% of participants would routinely consider simultaneous pelvic exenteration and liver resection: 10% would never consider this an option and the remainder considered synchronous resection only suitable if a limited liver resection with favourable localization was evident.

Whilst improved surgical and anaesthetic techniques may facilitate simultaneous pelvic exenteration and liver resection, these procedures constitute a major undertaking. Additional limiting factors include access to hepatobiliary services and having ample operative time. It is notable that 10% of panellists would never consider this an option. Finally, as expected the majority of participants would recommend adjuvant therapy, even following R0 resection. Length of treatment did not reach consensus, and there remains lack of international consensus on the type of adjuvant therapy [28].

This Delphi questionnaire provides a broad international opinion on best management practice for a challenging problem for which there is a paucity of evidence. The *PelvEx* collaborative members have considerable expertise in the management of advanced rectal cancer and their consensus on specific topics offers guidance while acknowledging a relative lack of evidence.

### **Conclusion:**

This study highlights the diverse management strategies for patients with advanced rectal cancer all liver metastases. It provides recommendations from an experienced international group regarding the multidisciplinary management approach for a challenging problem for which there is remains a paucity of evidence.

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STATEMENT	FINAL ROUND OPTIONS	PERCENTAGE CONSENSUS
<b>What is the correct definition of synchronous liver metastasis</b>	Diagnosed at same time as rectal primary	* 87.4%
	Diagnosed within 3-month	12.6%
<b>Synchronous liver metastasis in the setting of advanced rectal cancer has less favorable cancer biology and poorer survival than</b>	Yes	* 91.8%

<b>metachronous liver metastasis</b>	Unsure	8.2%
<b>MRI liver should be performed in all patients considered for pelvic exenteration (locally advanced and recurrent rectal cancer) prior to undertaking exenteration</b>	Only if there are concerns on routine staging	87.3%
	Yes	12.7%
<b>PET-CT should be performed in all patients considered for pelvic exenteration (recurrent rectal cancer) prior to undertaking exenteration</b>	Yes	73.9%
	Only if there are concerns on routine staging	26.1%
<b>How often does routine use of PET-CT for preoperative assessment change the surgical plan?</b>	Sometimes	78.4%
	Rarely	21.6%
<b>In a patient with asymptomatic and resectable <i>locally advanced rectal cancer</i> requiring pelvic exenteration, who also has liver metastasis, what would your first treatment be:</b>	Induction chemotherapy	88.1%
	Short course radiotherapy, then systemic chemotherapy – then liver resection – then exenteration	11.9%
<b>In a patient with symptomatic and resectable <i>locally advanced rectal cancer</i> requiring pelvic exenteration, who also has liver metastasis, what would your first treatment be:</b>	Defunctioning stoma - then induction chemotherapy - then re-assess	86.6%
	Defunctioning stoma - then short-course radiotherapy followed by chemotherapy - then resection	13.4%
		*

<b>In a patient with symptomatic but unresectable <i>locally advanced</i> rectal cancer, who also has liver metastasis, what would your first treatment be:</b>	Defunctioning stoma	95.6%
	Endoluminal stent if technically possible	4.4%
<b>In a patient with asymptomatic and resectable <i>locally advanced</i> rectal cancer, and borderline operable liver metastasis, what would your first treatment be:</b>		*
	Induction chemotherapy (97%)	97%
	Short course radiotherapy, then systemic chemotherapy – then liver resection – then exenteration	3%
<b>Chemotherapy for unresectable liver metastasis should entail:</b>		*
	FOLFOX/FOLFIRI + Biological depending on molecular testing	98.5%
	FolFox/FolFiri	1.5%
<b>In setting of a patient that has oligometastatic disease and is deemed suitable for pelvic exenteration and liver resection, what is your preference</b>		
	Stage Resection	74.8%
	Simultaneous Resection	25.2%
<b>What is your opinion of one-stage resection of primary tumour (pelvic exenteration) and liver resection</b>	Only in cases of limited hepatectomies	
		74.1%
	Only in favorable cases	13.1%
	Do not have the sub-specialties expertise available in same hospital to provide one-stage resection	12.6%
<b>After R0 surgery of both rectal and liver tumour, would you consider adjuvant chemotherapy</b>		*
	Yes, routinely	85.9%
	Yes, in selected cases	14.1%
<b>If for adjuvant chemotherapy, how long would you recommend</b>	6-months	77.6%

	Depends	12.7%
	3-months	9.7%
<b>How many liver metastases is it safe to remove in synchronous hepatic resection and pelvic exenteration</b>	Depends on localization of lesions	66.7%
	Depends on liver remnant and resectability	22.1%
	Would not consider this as an option	11.1%

Table 1: Results from the final round of the *PelvEx Collaborative* Delphi Questionnaire.

\*Indicates consensus reached

## SUPPORTING INFORMATION

### **PELVEX Collaborative:**

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