Original article:

Peritonectomy and HIPEC- a novel modality in the treatment of peritoneal carcinomatosis in a tertiary hospital in Coastal Karnataka

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ABSTRACT:

Peritoneal Surface Malignancies (PSM) can be defined as those–originating from the peritoneum itself (Primary peritoneal malignancy) or metastatically spread to the peritoneum from a different primary site (Secondary peritoneal malignancy)

PSMs are often a major source of morbidity and mortality. The treatment of choice for primary peritoneal malignancy is Peritonectomy+ HIPEC (Hyperthermic Intra-peritoneal chemotherapy)

However, Secondary peritoneal carcinomatosis arising from the colon or ovary can be treated by this modality with curative intent. HIPEC is believed to improve the progression-free survival and overall survival when combined with peritonectomy

INTRODUCTION

Peritoneal Surface Malignancies (PSM) can be defined as those–originating from the peritoneum itself (Primary peritoneal malignancy) or metastatically spread to the peritoneum from a different primary site (Secondary peritoneal malignancy)

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METHODS AND MATERIALS

Four cases performed in a single centre at Justice K.S. Hegde Charitable Hospital for the first time in Mangaluru. These patients have received pre-operative chemotherapy. Peritonectomy with HIPEC was done for all 4 patients. HIPEC was administered for a period of 90 minutes maintaining the temperature at 42 degrees Celsius. Intra-peritoneally, Cisplatin-based chemotherapy was used for Carcinoma ovary and Mitomycin-based chemotherapy was used for Carcinoma colon.

Case 1 - 37 year old housewife from Puttur with Carcinoma Ovary –Stage III C. Status-post TAH (Total abdominal Hysterectomy) + BSO (Bilateral Salpingo-oophorectomy) + Omentectomy+ Pelvic lymphadenectomy. CECT abdomen and pelvis-Multiple nodular enhancing deposits seen within the pelvic and parietal peritoneum

Case 2 - 40 year old male with carcinoma transverse colon with infra-umbilical nodule. Post-transverse colectomy and 12 cycles of chemotherapy. PET CT -No evidence of colonic wall thickening, further marginal increase in size of metabolically active peri-umbilical metastatic deposit

Case 3 - 37 year old female hailing from Ankola - case of metastatic mucinous adenocarcinoma of ascending colon + Krukenberg Tumour . S/P 10 cycles NACT and right hemicolectomy. CECT – heterogeneously enhancing solid cystic lesions in bilateral adnexa suggestive of Krukenberg tumour

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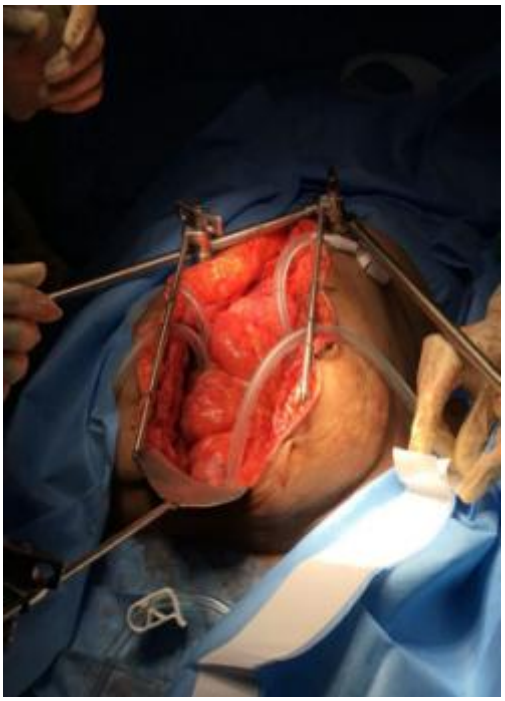
Case 4 - 42 year old female hailing from Davangere - case of metastatic adenocarcinoma of sigmoid colon with multiple peritoneal metastasis. Post-10 cycles NACT and left hemicolectomy. CECT -Multiple peritoneal and omental deposits, multiple para-aortic lymph nodes

MECHANISM

Cisplatin and Mitomycin-C was used to deliver the intra-peritoneal chemotherapy. Once the machine was initiated, the inflow begins once the temperature rises till a maximum of 42 degrees. The drug then circulates in the abdomen delivering the drug to various parts of the abdomen. Monitoring of the vitals and various parameters were assessed at intervals as depicted in the subsequent pictures.

HIPEC Machine

TUBINGS



CHECK LIST 30 MINS BEFORE STARTING HIPEC

All fluid warmers switched off. Body warmer set to ambient temperature. Laboratory studies of serum electrolytes, blood gas analysis, coagulation, haemoglobin and blood sugar are done. Intravenous fluid infusion increased to approximately 1800 mL/h. Continuous temperature evaluation and documentation of urine output every 15 min throughout the period of HIPEC

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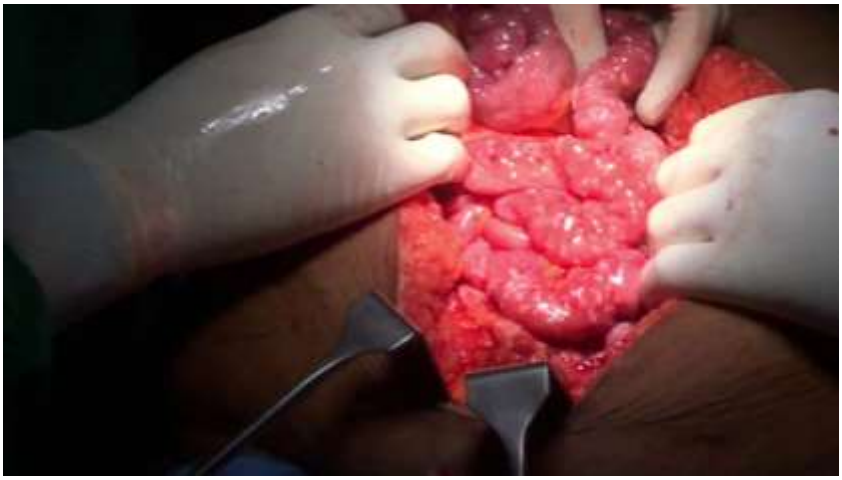
	pH	Na/K/Ca	Hb	Blood Sugar	PT/INR
Baseline	7.38	134/ 4.7/ 9.1	12.3	145 mg/dl	1.20
2 hrs after Incision	7.36	129/ 4.2/ 8.9	11.2	130 mg/dl	1.16
30 mins before HIPEC	7.41	131/ 4.3/ 8.8	10.9	90 mg/dl	1.40
30 mins after starting	7.43	132/ 4.3/ 8.7	12.1	103 mg/dl	1.23
At the end	7.39	133/ 5.1/ 9	11.7	98 mg/dl	1.45

FIGURE DEPICTING MULTIPLE PERITONEAL DEPOSITS

	Core body Temperature	Urine output
15 mins	**36.1 degrees**	**200 ml**
30 mins	**36.70 degrees**	**320 ml**
45 mins	**36.80 degrees**	**290 ml**
60 mins	**36.9 degrees**	**360 ml**



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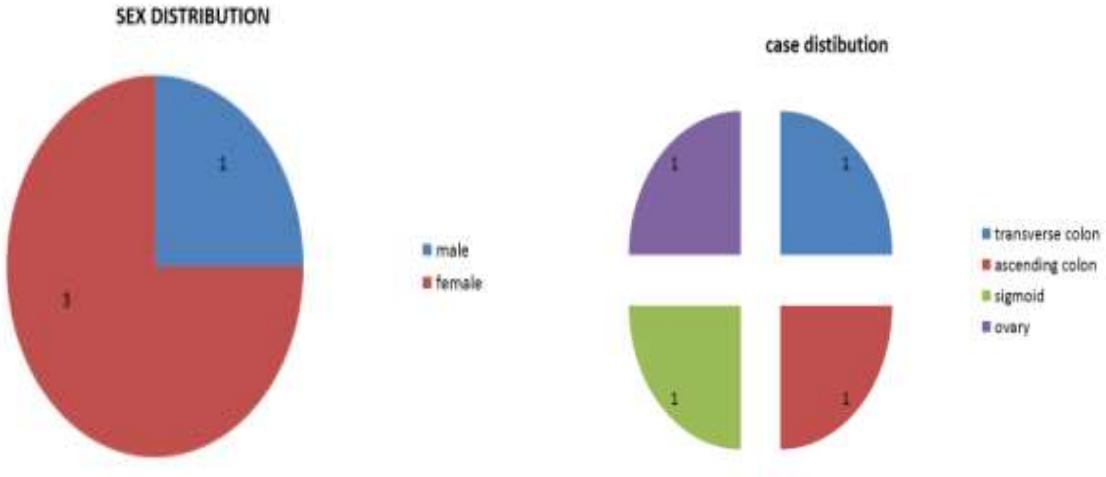
RESULTS

Of the 4 cases, 1 was male and 3 were female.

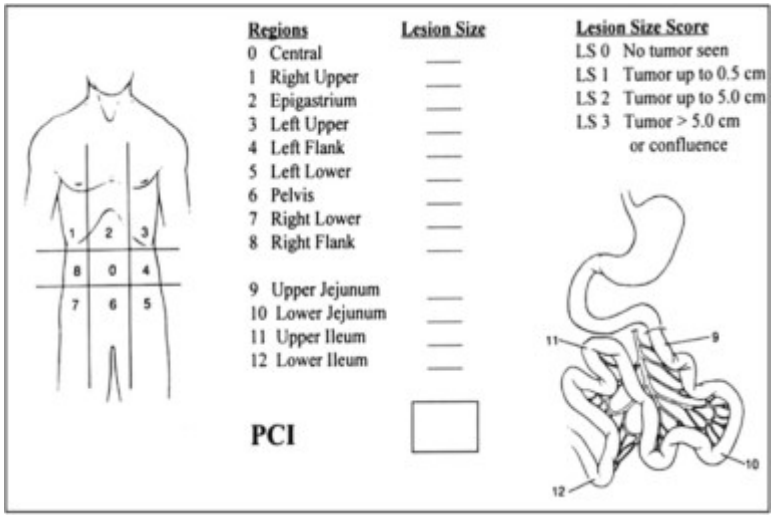


Case distribution - carcinoma ovary, carcinoma ascending colon, carcinoma sigmoid and carcinoma transverse colon. All had multiple peritoneal and omental deposits

In all the 4 patients, no morbidity during the intra-operative period. Good tolerance by the patients during the procedure. They were extubated on post-operative day 1. Mean duration of surgery was 8+/-1 hours for the entire procedure. Mean hospital stay for all 4 patients was 8+/-2 days. They were discharged and advised to review after a month when adjuvant chemotherapy was initiated

DISCUSSION

Peritonectomy+ HIPEC is a new concept, especially showing potential in metastatic peritoneal carcinomatosis. Extent of peritonectomy depends on Tumour biology and pathophysiology. Mode of spread in Primary PSM is of multiple origin whereas in Secondary PSM, dissemination occurs by either Trans-Mesothelial route and trans-Lymphatic route. Mean Peritoneal Carcinomatosis Index (PCI) in all four cases was found to be 16. PCI is calculated as shown in the figure below



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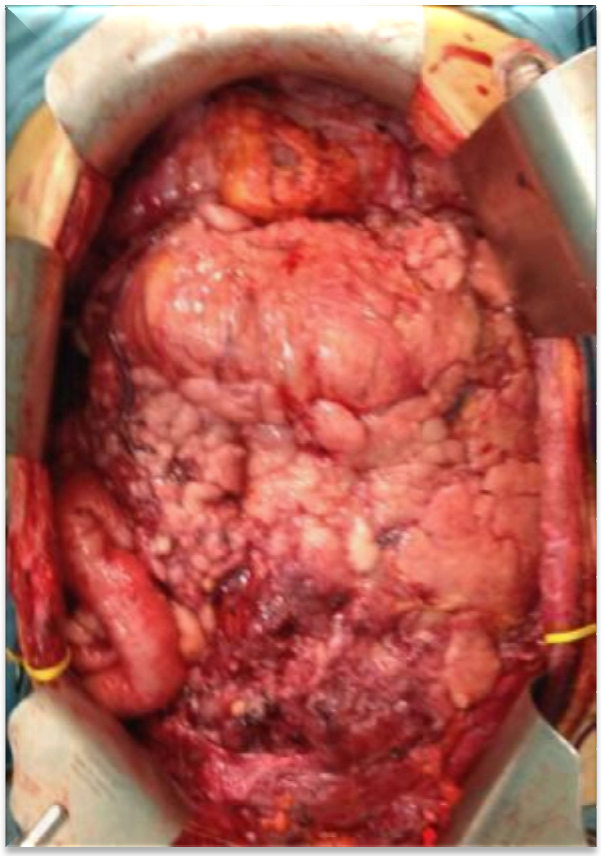
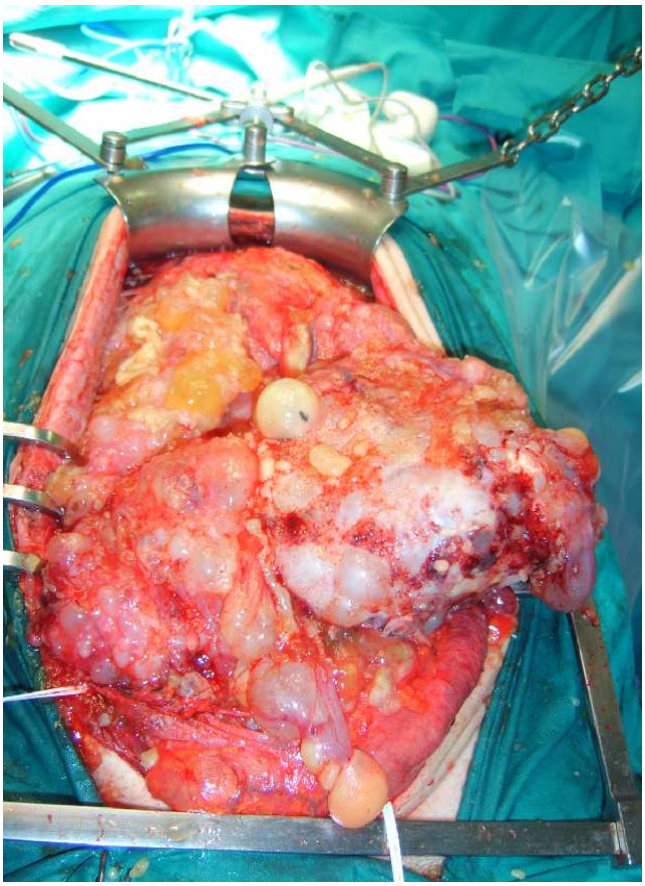
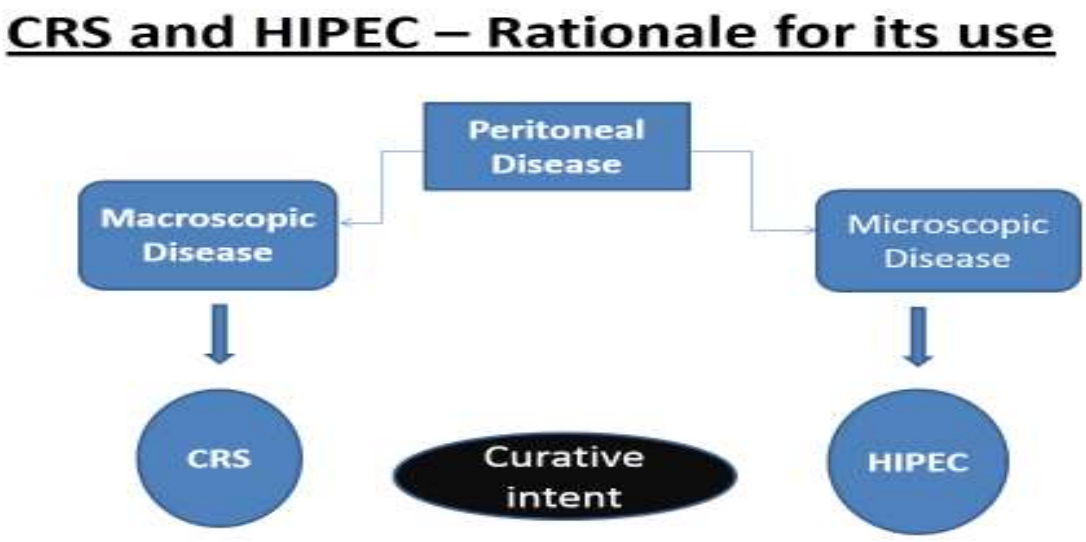
PCI - 28



PCI - 35





Peritoneal surface malignancy is a group of heterogeneous disease with a common pathophysiology. No long term survivors in the past. Treatment philosophy has changed in the last decade. CRS and HIPEC are the backbone in the treatment of peritoneal carcinomatosis. There is a lot of heterogeneity among institutions regarding protocols of management. Dedicated institutions are coming out with good results. This seems to be be forming the main say in the management of peritoneal carcinomatosis.

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CONCLUSION

Thus, through this series, we would like to convey that this novel modality could be adopted in other center for the benefit of the patients as it can significantly improve disease-free and overall survival rates in those with peritoneal carcinomatosis.

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