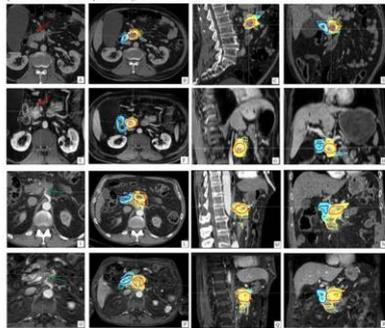


sent to the participating centers. CT-GTVs were contoured while blinded to MRI data sets. Dice Similarity Index was used to evaluate the spatial overlap accuracy of both GTVs of all centers with respect to a national benchmark, identified on the basis of per-year high volume pancreatic cancer treatment center.

Results

Thirty-one radiation oncologists from different Institutes joined the study and submitted the delineated volumes for both cases on CT scans and MRI images, respectively (Figure 1). CT- and MRI-GTV volumes were $21.6 \pm 9.0 \text{ cm}^3$ and $17.2 \pm 6.0 \text{ cm}^3$, respectively for Case 1, and $31.3 \pm 15.6 \text{ cm}^3$ and $33.2 \pm 20.2 \text{ cm}^3$, respectively for Case 2. MRI-GTV mean volume resulted significantly smaller than CT-GTV in the borderline resectable case ($p < 0.05$), whereas no significant GTV differences between the two different imaging modalities were reported in Case 2. A substantial agreement was shown by the median DICE index for CT- and MRI-GTV resulting as 0.74 (IQR: 0.67-0.75) and 0.61 (IQR: 0.57-0.67) for Case 1; a moderate agreement was instead reported for Case 2: 0.59 (IQR: 0.52-0.66) and 0.53 (IQR: 0.42-0.62) for CT- and MRI-GTV, respectively.

Figure 1. Graphic representation on axial (Panels A, B, E, F, I, L, O and P), sagittal (Panels C, G, M and Q) and coronal (Panels D, H, N and R) planes of inter-observer variation between 31 Centers for CT (Panels A, B, C and D) and MRI (Panels E, F, G and H) GTV and duodenum of Case 1 (borderline resectable) and for CT (Panels I, L, M and N) and MRI (Panels O, P, Q and R) GTV and duodenum of Case 2 (unresectable). GTV and duodenum benchmark delineations are represented in red and blue solid outline, respectively. Yellow and light blue solid outlines represent GTVs and duodenum contours of the remaining 30 participating Centers. Panels A, E, I and O represent axial CT and MRI images of Case 1 (borderline resectable) and Case 2 (unresectable) without contours. Panels A and E: borderline resectable case for the encasement of the superior mesenteric vein (red arrow); Panels I and O: unresectable case for the tumor infiltration of the colon trunk (green arrow).



Conclusion

DICE index for GTV delineation agreement was acceptable in the borderline resectable case, whereas a larger overlap deviations was recorded in the unresectable case, suggesting that the major issues in the outlining of macroscopic disease are present when vascular structures are more involved. Based on these results, CT scan, thanks to its high definition of tumor vessels infiltration, can still be considered as the gold standard for volume delineation in pancreatic cancer, especially in unresectable patients. Instead, since diagnostic MRI resulted in smaller GTV in borderline resectable case, the integration of the two imaging methods could offer an improved accuracy of target delineation when radiotherapy is delivered with more conformed techniques such as IMRT, VMAT and/or SBRT.

PO-0810 Outcome following definitive radiotherapy in oesophageal cancer: A single UK centre experience.

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Purpose or Objective

Definitive chemo radiotherapy (dCRT) is the standard of care for inoperable oesophageal cancer patients, however, a large proportion are not suitable due to multiple factors such as co-morbidities or poor performance status. For this group definitive radiotherapy (dRT) alone may be considered. The consensus guidelines are lacking in this regards with wide variation in doses/ techniques of radiotherapy. Here we report our

experience of patients treated with dRT at one of the largest cancer centre in UK.

Material and Methods

A total of 138 patients who received dRT for oesophageal cancer at the Christie hospital, Manchester, UK, from December 2009 to October 2013 were considered for the analysis. Radiotherapy was initially delivered using 3 field 3D conformal radiotherapy (3D-CRT) and subsequently 5-8-field intensity modulated therapy (IMRT) as practice evolved. Patients were followed up routinely in outpatient clinic after treatment at 3 monthly intervals for one year and then less frequently. Routine re-staging was not performed but investigations were carried out for concerning new or unresolving symptoms. Statistical analysis was performed using SPSS version 21. Survival was calculated from the first day of radiotherapy using the Kaplan-Meier technique and effect of disease characteristics tested using the log rank test. There was a minimum of 12 months follow up following completion of treatment.

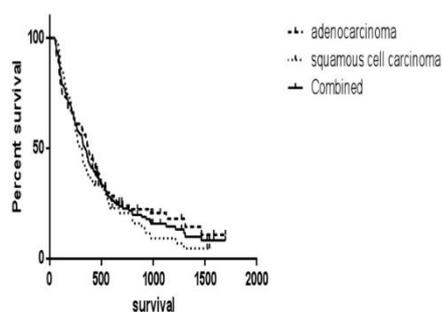
Results

All patients commenced a course of 55 Gray (Gy) in 20 daily fractions over four weeks, with the exception of seven patients who received 50.4 Gy in 28 daily fractions over five and one half weeks due the volume of stomach involved by GOJ tumours. IMRT was received by 92.0% (127) of patients with the remaining 8.0% (11) treated with 3D-CRT. The demographics of patients and tumour characteristics are shown in table-1. The median follow up time was 22.9 months (range 11.9-55.8) in the 23 survivors at time of analysis and 11.1 months (range 1.5-55.8) in all patients. Post treatment swallow function was recorded at four to twelve weeks post radiotherapy in 78% (80) of patients with dysphagia at initial presentation. Improvement was noticed in 55% (44), stable swallow in 13% (11) and worsened swallow in 32% (26). Of the 138 patients treated, 4 failed to complete the intended radiotherapy course. The symptomatic oesophagitis was experienced by 81.6% (112) with strong opioid analgesics required during treatment or in the six weeks post treatment by 35.5% (49) of patients. Median overall survival (OS) from the start of radiotherapy was 11.1 months with a four year OS of 8.2%. There was no significant difference observed based on histology e.g. median OS for adenocarcinoma and squamous cell carcinoma was 12.1 vs. 9.8 months respectively (log rank, $p = 0.27$) (figure-1).

Table 1: Patient characteristics

Characteristics	Squamous (N=56)	Adenocarcinoma (N=82)	Total (N=138)
Age	Median (range) 80 (49-92)	78 (55-91)	79 (49-92)
Gender	Male 24 (42.9%)	58 (70.7%)	82 (59.4%)
	Female 32 (57.1%)	24 (29.3%)	56 (40.6%)
Performance Status	0 5 (8.9%)	5 (6.1%)	10 (7.2%)
	1 27 (48.2%)	37 (45.1%)	64 (46.4%)
	2 20 (35.8%)	35 (42.7%)	55 (39.9%)
	3 4 (7.1%)	5 (6.1%)	9 (6.5%)
	4 15 (26.8%)	5 (6.1%)	20 (14.5%)
ACE-27 score	1 18 (32.1%)	26 (31.7%)	44 (31.9%)
	2 14 (25.0%)	33 (40.3%)	47 (34.1%)
	3 6 (10.7%)	16 (19.5%)	22 (15.9%)
	Not recorded 3 (5.4%)	2 (2.4%)	5 (3.6%)
	4 9 (16.1%)	26 (31.7%)	35 (25.4%)
O'Rourke dysphagia score	1 13 (23.2%)	17 (20.7%)	30 (21.7%)
	2 22 (38.2%)	28 (34.1%)	50 (36.3%)
	3 10 (17.9%)	8 (9.8%)	18 (13.0%)
	4 2 (3.6%)	3 (3.7%)	5 (3.6%)
	5 2 (3.6%)	3 (3.7%)	5 (3.6%)
Pre-treatment weight-loss	<10% 25 (44.6%)	48 (58.6%)	73 (53.0%)
	≥10% 17 (30.4%)	12 (14.6%)	29 (21.0%)
	Not recorded 14 (25.0%)	22 (26.8%)	36 (26.0%)
Nutritional support	None 23 (41.1%)	44 (53.7%)	67 (48.5%)
	Stent 7 (12.5%)	6 (7.3%)	13 (9.4%)
	RIG 25 (44.6%)	30 (36.6%)	55 (39.9%)
	RIG + stent 1 (1.8%)	2 (2.4%)	3 (2.2%)
	Upper 4 (7.1%)	0	4 (2.9%)
Disease site within oesophagus	Middle 24 (42.9%)	6 (7.3%)	30 (21.7%)
	Lower 27 (48.2%)	51 (62.2%)	78 (56.6%)
	GOJ 1 (1.8%)	25 (30.5%)	26 (18.8%)
	IA 5 (8.9%)	10 (12.2%)	15 (10.9%)
Stage	IB 5 (8.9%)	15 (18.3%)	20 (14.5%)
	IIA 3 (5.4%)	0	3 (2.2%)
	IIB 12 (21.4%)	27 (32.8%)	39 (28.3%)
	IIIA 27 (48.2%)	24 (29.3%)	51 (36.8%)
	IIIB 0	3 (3.7%)	3 (2.2%)
	IIIC 4 (7.2%)	3 (3.7%)	7 (5.1%)
	IV 2 (3.6%)	9 (11.0%)	11 (8.0%)
Radiotherapy technique	IMRT 54 (96.4%)	73 (89.0%)	127 (92.0%)
Follow-up (months)	Median (range) 10.3 (2-51)	12.6 (2-56)	11.1 (2-56)

Figure 1: Kaplan Meier survival curve for histological sub-type



Conclusion

High dose dRT alone appears to offer the chance of long-term survival in around 10% for oesophageal patients not fit for surgery or dCRT and should be considered instead of palliative measures only

PO-0811 SBRT compared to sorafenib in locally advanced hepatocellular carcinoma: a propensity score analysis

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Purpose or Objective

Stereotactic body radiation therapy (SBRT) has emerged as a safe and effective treatment for patients with hepatocellular carcinoma (HCC), but its role in advanced HCC is not well defined. In this study we aim to assess the efficacy of SBRT in comparison to sorafenib treatment in patients with advanced HCC.

Material and Methods

We included 901 patients treated with sorafenib at six tertiary centers in Europe and Asia and 122 patients treated with SBRT from thirteen centers in Germany and Switzerland. Medical records were reviewed including laboratory parameters and treatment characteristics. Propensity score matching was performed to adjust for differences in baseline characteristics. The primary endpoint was overall survival (OS) and progression-free survival (PFS).

Results

Median OS of SBRT patients was 18.1 [10.3 - 25.9] months compared to 8.8 [8.2 - 9.5] months in patients treated with sorafenib. After adjusting for different baseline characteristics, the survival benefit for patients treated with SBRT was still preserved with a median OS of 17.0 [10.8 - 23.2] months compared to 9.6 [8.6 - 10.7] months in patients treated with sorafenib. SBRT of intrahepatic lesions in patients with extrahepatic metastases was also associated with improved OS compared to patients treated with sorafenib in the same setting (17.0 vs 10.0 months, $p=0.012$) whereas in patients with portal vein thrombosis (PVT) there was no survival benefit in patients with SBRT.

Conclusion

In this retrospective comparative study, SBRT was superior compared to sorafenib in patients with advanced HCC.

PO-0812 Pathological validation of endoscopically placed fiducials on tumor borders in esophageal cancer.