Mutation stratification of desmoid-type fibromatosis using a radiogenomics approach

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Background A small minority of patients present with locally advanced cutaneous squamous cell carcinoma (cSCC). The aim of this study was to evaluate the effectiveness of Tumor necrosis factor α (TNF) and melphalan based isolated limb perfusion (TM-ILP) as a limb saving strategy for locally advanced extremity cSCC.
Material and methods A retrospective search from prospectively maintained databases at two tertiary referral centers was performed to identify patients treated with TM-ILP for locally advanced cSSC of an extremity between 2000 and 2015.
Results A total of 30 patients treated with TM-ILP for cSCC were identified, with a median age of 71 years (36-92) and 50% female. Response could not be evaluated in 3 patients. After a median follow up of 25 months, the overall response rate was 81% (n=22), with 16 patients having a complete response (CR, 59%). A total of 7 patients developed local recurrence, with a median time to recurrence of 9 months (Interquartile Range 7 – 10). Progressive disease was observed in 5 patients (19%). Limb salvage rate was 80%. The overall 2-year survival was 67%.

Table 1
Patients, tumor, and treatment characteristics

	n (%)	Median (range)
Gender		
Male	15 (50)	
Female	15 (50)	
Age in years		71 (36-92)
Size		
<5cm	10 (38)	
>5cm	16 (62)	
Site		
Arm	3 (10)	
Hand or wrist	5 (17)	
Leg	16 (53)	
Ankle or foot	7 (20)	
Number of tumors		
Unifocal	24 (80)	
Multifocal	6 (20)	
Disease stage at presentation		
Primary	18 (60)	
Recurrent	10 (33)	
Metastatic	2 (7)	
Concurrent metastasis		
None	25 (83)	
Lymph node	3 (10)	
Distant	2 (7)	
Surgical approach		
Axillary	3 (10)	
Brachial	6 (20)	
Femoral	20 (67)	
Iliacal	1 (3)	
Doses		
TNF		2 (1-3)
Melphalan		60 (25-80)
Hospital stay in days		6 (1-72)

Conclusions TM-ILP should be considered as an option in patients with locally advanced cSCC in specialized centers, resulting in a high limb salvage rate.

Conflict of interest: No conflict of interest.

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MUTATION STRATIFICATION OF DESMOID-TYPE FIBROMATOSIS USING A RADIOGENOMICS APPROACH

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Background Radiogenomics is a promising technique, correlating quantitative imaging features with molecular characteristics. Desmoid-type fibromatosis (DTF) is a rare, borderline, soft tissue tumor that arises from musculoaponeurotic structures. The vast majority of DTF tumors harbor a specific point mutation at the CTNNB1 gene, affecting two codons in exon 3; substituting threonine at position 41 with alanine (T41A) and replacing serine at position 45 with phenylalanine (S45F). Tumors without any mutation in the CTNNB1 gene are considered to be wildtypes. This study evaluates the use of radiogenomics features extracted from T1 weighted Magnetic Resonance (T1w MR) images to predict CTNNB1 mutation status (T41A, S45F and wildtype) of DTF tumors.
Material and methods Approval from the Medical Ethics Committee of Erasmus MC in Rotterdam, the Netherlands was obtained for this study (MEC-2016-339). Cases of treatment naive extra-abdominal and abdominal wall DTF, with available digital T1w MR images, were selected from the pathology database of the Erasmus MC, Rotterdam, the Netherlands. Sanger sequencing on formalin fixed paraffin embedded material was performed to obtain CTNNB1 mutation status in case of undetermined mutation status. Tumors were semi-automatically annotated on the anonymized T1w MR images by a single clinician. Features quantifying shape, intensity and texture were extracted for a total of 424 per patient, from the images using the segmentations as region of interest. A Support Vector Machine (SVM) was trained and evaluated using these features in a 100x random split cross validation, with the training set consisting of 80% of the patients. For each mutation, an SVM was constructed using a one-vs.-all approach. Classification performance was assessed by the area under the receiver-operating-characteristic curve (AUC).
Results A total of 49 patients; 14 males and 35 females, with DTF located extra-abdominal (n=37) or in the abdominal wall (n=12) were included. Tumors harbored a T41A mutation in 21 cases, a S45F mutation in 11 cases and 17 tumors were considered to be wildtype tumors. The radiogenomics approach resulted in AUC 95% confidence intervals of [0.28, 0.61], [0.43, 0.73] and [0.61, 0.88] for classification of the T41A, S45F and wildtype mutations, respectively.
Conclusions The preliminary results of this radiogenomics model show the promising predictive value for classification of wildtype mutations, but could not differentiate between the various genetic mutations. The use of a larger, multi-center dataset with the use of additional MRI sequences and more advanced multi-class machine learning approaches could improve the radiogenomics model to develop a prediction model for DTF that can be used both in research and in clinical practice.
Conflict of interest: No conflict of interest.

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PRESSURIZED INTRAPERITONEAL AEROSOL CHEMOTHERAPY (PIPAC) BEFORE CYTOREDUCTIVE SURGERY AND HYPERTHERMIC INTRAPERITONEAL CHEMOTHERAPY FOR NONRESECTABLE PERITONEAL METASTASIS

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Background: PIPAC is a recent approach for intraperitoneal chemotherapy with promising results for patients with nonresectable peritoneal metastasis (PM). The aim of this study was to describe the clinical characteristics and extent of disease of the patients who became resectable after PIPAC and undergone cytoreductive surgery (CRS) and hyperthermic intraperitoneal chemotherapy (HIPEC).
Material and Methods: This is a retrospective analysis of prospective