MRI FEATURES PREDICTIVE OF RESPONSE TO METHOTREXATE AND VINORELBINE IN DESMOID FIBROMATOSIS

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INTRODUCTION

- Desmoid fibromatosis (DF) is a mesenchymal tumor that is locally aggressive and historically treated with surgical resection, with high recurrence rates1.
- Systemic treatment of progressive DF can be associated with improved progression-free rates; however, the use of medical therapy remains controversial.
- Treatment response as defined by RECIST by measuring maximum tumor dimension (Dmax) may not accurately evaluate response to medical treatment in desmoid patients.
- Recent studies suggest alternatives to RECIST criteria2.
- The current study sought to assess if imaging parameters such as approximate tumor volume (Vtumor) and MRI features, specifically T2 signal, were more predictive of response to medical therapy than Dmax.

METHODS

- Using our Sarcoma Database, 22 patients with biopsy proven DF as per WHO Classification3 who were treated with Methotrexate and Vinorelbine (MTX/VIN) and followed with MRI throughout treatment were identified.
- Dmax, Vtumor, and quantitative T2 hyperintensity using interquartile range scoring on MRI were compared pre-, mid- (between 3-9 months) and post-treatment.
- On T2-weighted or T2-weighted fat-saturated MRI images, tumors were ranked as containing: 0-25%, 25-50%, 50-75% or 75-100% of internal high T2-signal intensity.
- Vtumor was approximated using an elliptical volume equation (V = π/6L*W*H).
- Treatment response was defined as:
  - Partial Response (PR) - size or T2 quartile score decreased
  - Stable Disease (SD) - no change in size or T2 quartile
  - Progression of Disease (PD) - increase in size or T2 quartile Complete Response (CR) - tumor resolution and/or entire lesion was hypointense on T2-weighted images.

RESULTS

- At end of treatment (median 20 mos (range 9-27)), Dmax mean decreased by -30% and Vtumor decreased by -76%.
- 50% of patients (n=11) had SD as per Dmax but were PR as per Vtumor %change (-76%, range -86 to -30).
- In those 11 patients, T2 showed CR in 6 patients and PR in 5 patients.
- In figure 2, pre-tx Dmax did not show a response to treatment whereas Vtumor decreased as did T2 intensity.
- On T2-weighted imaging, CR was observed in 13 and PR in 5 patients.
- Mid-treatment, 2 had PD and 7 patients had SD as per Dmax and Vtumor with T2 change indicative of PR in all cases.
- Both patients with PD continued therapy and had CR at end of treatment.
- Four patients progressed post-treatment, median Progression Free Survival (PFS) was 31 months (95% CI: 14.9-137), and all had complete response (CR) at the end of MTX/VIN treatment on T2 imaging.

DISCUSSION

- Assessment of response to MTX/VIN with Dmax in patients with DF is problematic as longest axis of tumor may not change.
- Estimated volume of tumor shows greater response to therapy than Dmax for half of the patients in the study.
- T2 signal intensity assessment mid-treatment may be more indicative of response than RECIST, resulting in continued therapy for patients who may benefit.

CONCLUSION

- Evaluation of treatment response for DF utilizing an estimated volume of tumor and monitoring the degree of T2-weighted signal intensity change within the tumor may be better predictors of response to medical therapy than maximum tumor dimension.
- Findings from this study warrant prospective multi-institutional validation.

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REFERENCES