TITLE: Testing of a Transperineal Guide Grid for MR guided prostate procedures using Optical and Fiducial Fusion.

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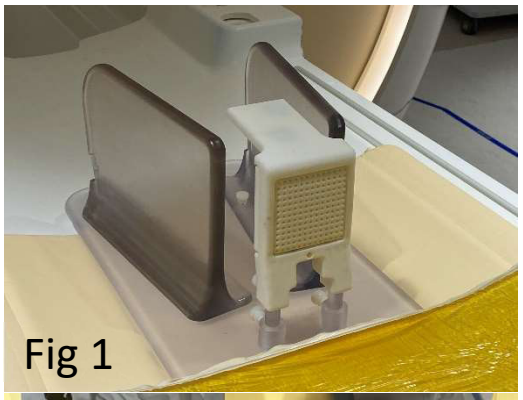
Fig 1


Fig 2

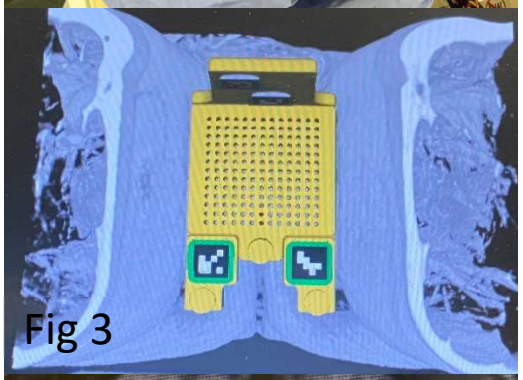
Fig 3

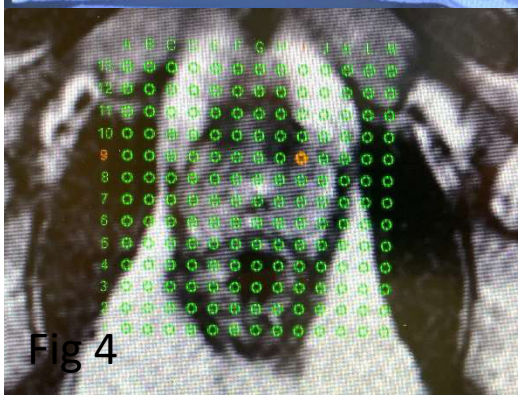
Fig 4

PURPOSE: To describe the testing and feasibility of a transperineal guide grid based on optical fusion to aid in needle placement for biopsy and ablation.
MATERIALS AND METHODS: The transperineal guide grid with optical fusion was developed by Clear Guide Medical in collaboration with Mayo Clinic. The proposed tool is intended to be used in combination with the Clear Guide's existing SCENERGY guidance software program, Clear Guide VisiMARKER, Clear Guide Optical Head, and Clear Guide CORE hardware. The hardware consists of a base plate situated under the supine semi-lithotomy patient on the MRI table (Fig 1 and 2). The base plate has holders for the guide grid holder with visible imbedded markers and leg holder plates to create workable space for needle placement. Guide grid is placed in the grid holder for needle guidance. The software will pull in a MRI T2 sequence which is used for automatic registration. Once registered the images can be scrolled with overlay of the biopsy grid. Specific needle paths can be selected and scrolled to be able to determine needle path in relation to adjacent structures.
RESULTS: The initial testing with volunteers demonstrates feasibility of grid positioning with the plate providing a stable platform (Fig 2). From an acquired T2 image sequence covering the grid and prostate, the software is able to automatically register the grid position and project the needle paths into the image dataset (Fig 3 and 4).
CONCLUSION: This system will potentially offer an optical fusion system for transperineal needle placement in the MRI environment, but it will have the flexibility to be utilized with CT or US as well. Initial testing demonstrates feasibility. Subsequent testing will be performed with patients undergoing prostate biopsy or ablation to determine the accuracy of needle guidance at the distance of the prostate (10 cm depth).