Creating a Synchronous Active Treatment Planning Environment using Virtual Breakout Rooms and Group-shared Document

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PROBLEM

Active Treatment Planning, where faculty and students collaboratively discuss treatment options, is an integral part of dental education and patient care.[1] Yet, the current pandemic has posed a threat to cultivating environments where students can approach faculties and classmates to share knowledge and perspectives. Alternatively, conducting meaningful small group discussions online has been a major challenge due to many limitations, including access to virtual platforms, faculty facilitators, and uncertainty of students' engagement.[2,3] Thus, an innovative solution is needed to advance our education.

SOLUTION

Active treatment planning was conducted using a hybrid approach, leveraging virtual breakout rooms (via Zoom) and a group-shared synchronous document (via a pre-shared Google Doc). One hundred and twenty-seven students were divided into 12 breakout rooms for team-based treatment planning (Figure 1).[4] Before joining Zoom, each student was asked to review the case and treatment plan individually as a graded assignment in order to ensure productive small group discussions.[5] The complete individual homework and the logically structured group-shared document are critical components for a self-directed small group discussion. Interactive components were built into the document to engage students, including a virtual implant placement. After the breakout rooms ended, all the groups would submit the written group document for feedback; two groups voluntarily shared their findings and treatment plan to obtain direct feedback from the instructors during the class. The document significantly supported the group discussion that everyone can be on the same page contributing to the notes as a goal-orientated group project. Finally, at the end of the class, the actual treatment outcome of the case was presented to provide real-life perception for the students.

RESULTS

The virtual breakout rooms were successfully implemented with technological support and logistical training of students during the introduction class of the course. With the help of a required individual assignment and synchronous shared document, all the students were engaged in a productive session to formulate treatment options and rationalize the ideal plan for the patient. The virtual implant placement did engaged students' interest (Figure 2). A challenge learned was the technology hiccups that students are using different devices and internet connections; therefore, a practice run is critical. We received very positive feedback from the

students (Figure 3). They appreciated the opportunity to discuss together and learn from each other, recognizing the details they may have missed. They also appreciate the mutual respect and different perspectives working toward a conclusion. Given the time allocation of the class, students have to work in a compressed format (10-minute introduction, 20-minute break-out room discussion, 15-minute group presentation, and 15-minute outcome debriefing). Most students expressed the need for more time. Presentation of the real treatment outcome stimulated several questions from the students at the end of the class and resulted in a very real and positive learning experience. While we were not able to completely recreate a face-to-face class with small group discussion, leveraging available technologies like Zoom and GoogleDocs can create constructive discussion and collaboration on real cases.

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Figures

Figure 1. Virtual breakout rooms and synchronous group-shared documents with interactive elements to facilitate active team-based treatment planning.

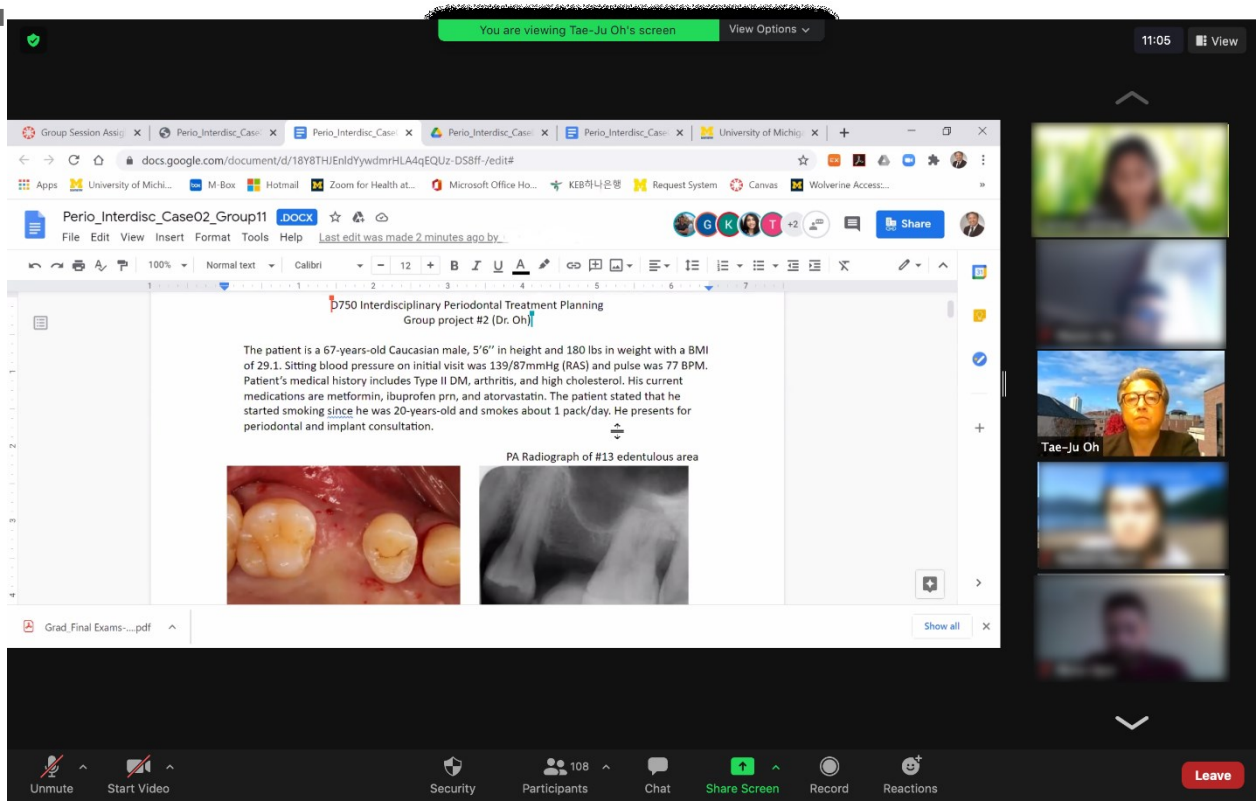

Figure 2. Complex case for interdisciplinary treatment planning. A, Pre-treatment radiographs with comprehensive clinical records was introduced to the students as part of the required assignment before class. B1 and B2, Creative team utilizing visuals to illustrate treatment plan options in the group-shared document and presented to the class. C, Post-treatment radiographs with clinical progress photos were demonstrated by the faculty to enhance students' formative experience for treatment progress and outcome reflection. D, Virtual implant placement on the synchronous group-shared document to provide opportunity for individual student to stay engaged in the activity. The implant can be rotated and moved as an object to place on the cross-sectional view of the alveolar ridge on CBCT. E, CBCT scans of pre- and post-ridge augmentation with the radiographic stent was presented at the end of the class to illustrate the concept of prosthetically driven implant placement.

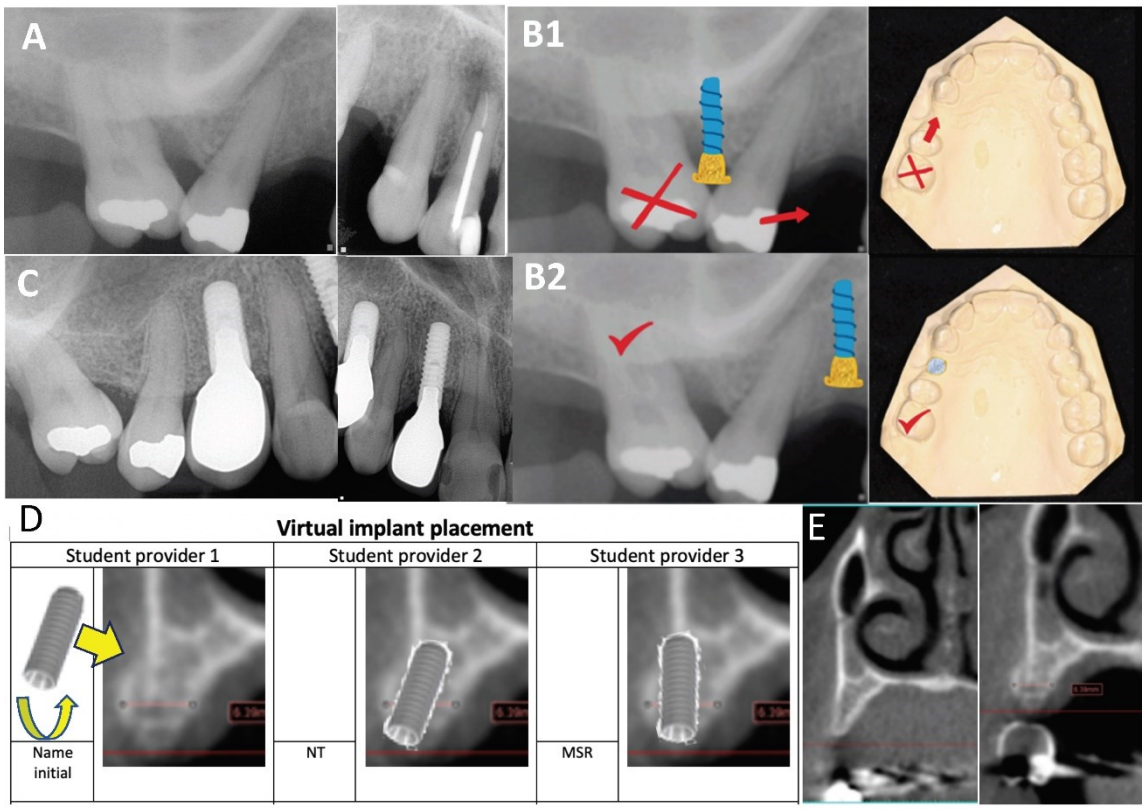

Figure 3. Representative student feedback from the class.

Student Initials	1. Your contribution to group assignment 2. Personal comments/feedbacks 3. Clinical Questions
EI	1. Participated in the group discussion, added information on the problem list and reorganized the treatment options. 2. I really enjoyed the group discussion of the case. Some members mentioned things about the case I did not even think of or consider. More time would have been beneficial in coming up with conclusions. 3. Are the teeth that were extracted prior periodontally involved?
MS	1. Contributed to problem list and possible treatments 2. I liked placing the implant on the picture. 3. How much healing can be expected with 6-8 mm pockets? Will these get any better over time?
JY	1. Contributed to the problem list, expected outcomes 2. This assignment required recalling previous information we had learned in our periodontal classes, it was a good review and application of them 3. What were the patients' desires for treatment, if any? How would that influence what we choose to do for the patient and how we navigate that conversation with her?
MSR	1. Joining group discussion, assessment of findings, contributing with treatment plan and editing document 2. Having more time to discuss the treatment options to get everybody's opinions heard will provide more insights, maybe the session could be divided in two. First zoom discussion in groups, then upload the assignment, and in the 2nd session/class present and discuss the case with the course directors/faculty to get their feedback. 3. If deciding to extract #2, can we do bone graft at the time of the extraction?
JB	1. Provided a rough draft for problem list and conditions of the case, and helped lead the discussion for the above two questions 2. Our team worked really together and we were able to come to a conclusion rather quickly with everyone's voices being heard 3. Can we perform guided tissue regeneration on the mesial of #2 and place a bone graft to widen the ridge of #5 at the same time? Would we just extend the flap from #2 to #5?
4 CF	1. Discussed assessment of conditions, treatment options, recommended treatment, and expected outcomes 2. It was helpful to discuss possible treatments with my classmates because many of us had thought of different treatment options. Time management was difficult because we had to review each of our findings and then discuss what we thought would be the best treatment. 3. Is uprighting of #2 necessary if the crown has tipped mesially into the edentulous space caused by the absence of #3? Why would you do this if you were not planning on placing an implant for #3?
JH	1. Discussed Treatment options and problem list 2. This patient presents with many problems that require interprofessional collaboration amongst many dental specialists. It was enlightening to discuss this with the group to hear different possibilities 3. Does number 7 have a good endodontic prognosis or should it be extracted immediately
AK	1. Joined the flipped classroom discussion, used the draft and discussion to answer the questions, made the final changes before submission. 2. Working in a team helped me consider and appreciate the facts that I failed to recognize when I did the assignment alone. Learned something. 1. Would it be possible or even advised to keep #4, orthodontically correct the alignment, combine it with perio surgery to save the tooth, given that it already has Grade II mobility?
JS	1. Contributed to group zoom discussion, phased and sequenced recommended treatment, and included expected outcomes. 2. I really enjoy working with my group as everyone contributes to discussion and there is much respect between us. 3. What, if any, other treatments are plausible for "hopeless" #7?
AG	1. Contributed to problem list, treatment options and expected outcomes list 2. It was great to discuss the case with the group, so many different perspectives on treatment options. It surely helps to hear everyone's rationale/thought process. 3. What is the prognosis/success rate for guided bone regeneration for #2 which has a significant vertical bone loss and pocket depth around 7mm?