Approximating Surface Matrix Band for Dentist to Use for Patients

Project Page

Date: October 19th, 2025 - October 25th, 2025

Client: Dr. Donald Tipple
Advisor: Prof. Beth Meyerand
Team:

Roshan Patel - rgpatel3@wisc.edu (Team Leader)

Keleous Lange - krlange@wisc.edu (Communicator & Co-BPAG)

Tanya Predko - tpredko@wisc.edu (BWIG & Co-BPAG)

Joseph Koch - jmkoch7@wisc.edu (BSAC)

Problem statement

Surface matrix bands are devices used by dentists to separate adjacent teeth during restorations of interproximal cavities (cavities found in-between two teeth). The matrix band serves to support the restoration material, to provide shape and contour to the tooth being restored, and to protect the adjacent tooth. Ideally, the width of the space between the two adjacent teeth is just large enough to fit one matrix band in order to ensure close proximal contact area, which prevents food impaction and decay. In the case of two cavities on two adjacent teeth, this process is tedious, as the dentist must complete the process from start to finish for each adjacent tooth individually. The goal of this project is to create a dental matrix band that effectively partitions adjacent teeth for more efficient tooth restoration procedures on interproximal cavities by making it possible to complete two adjacent restorations simultaneously.

Brief status update

The team has ordered the necessary materials for the prototype.

Summary of weekly team member design accomplishments

- Roshan Patel
    - Waterjet fabrication research
- Keleous Lange
    - Ordered materials
    - Fabrication method discussion
- Tanya Predko
    - Researched waterjet process for fabrication.
    - Met with the team to discuss fabrication methods.
- Joseph Koch
    - Worked on SolidWorks waterjet paths
    - Refined model dimensions

Difficulties / advice requests

There are no difficulties at this time.

Current design

N/A

Materials and expenses

Item	Description	Manufac-turer	Mft Pt#	Vendor	Vendor Cat#	Date	#	Cost Each	Total	Link
Category 1										
									$0.00	
									$0.00	
Category 2										
									$0.00	
									$0.00	
								TOTAL:	**$0.00**	

Major team goals for the next week

1. Prepare for show and tell
2. Do any prototyping possible with the materials available

Next week's individual goals

- Roshan Patel
    - Finalize prototype design
    - Work further on the fabrication method
- Keleous Lange
    - Cut prototypes
    - Tie up order and ensure everything is ready
- Tanya Predko
    - Create a fabrication protocol.
- Joseph Koch
    - Cut prototypes
    - Work on design iterations

Timeline

Task	September				October				November					December	
	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13
Project R&D															
Empathize	X														
Background…															
Prototyping															
Testings															
Deliverables															
Progress Reports	X	X	X	X	X	X	X								
Prelim presentation						X									
Final Poster															
Meetings															
Client															
Advisor	X	X	X	X	X	X	X								
Website															
Update	X	X	X	X	X	X	X								

Filled boxes = projected timeline
X = task was worked on or completed

Previous week's goals and accomplishments

- Ordered materials
- Looked further into waterjet feasibility

Activities

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Roshan Patel	10/23/2025	- Researched waterjet fabrication	1	1	16
Keleous Lange	10/23/2025	- Order materials - Discussed fabrication techniques	.5 1	1.5	16.5
Tanya Predko	10/23/2025	- Looked into waterjet process	1	1	21.5
Joseph Koch	10/23/2025	- Worked on fabrication process path	2	2	17