

Maxillo-mandibular Fixation



Team Members

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Client

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Overview

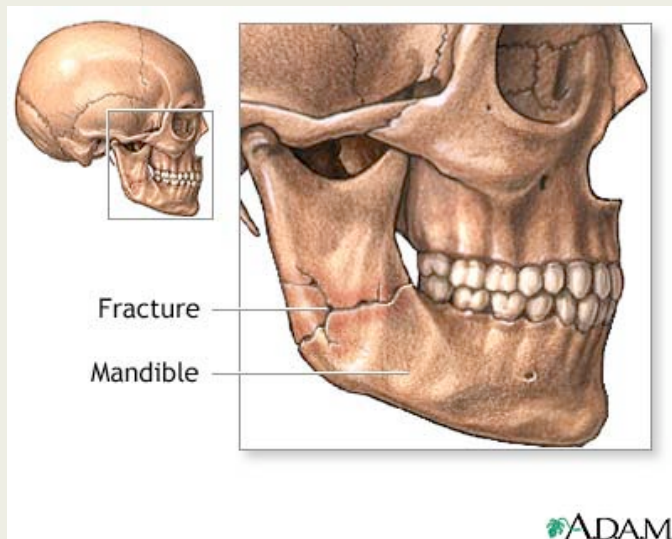


- Background
- Current Procedure
- Problem Statement
- Barton Bandage Design Specifications
- Barton Bandage Design
- Ligature Specifications
- Ligature Alternatives & Design Matrix
- Future Work

Background – Archbar & Ligature



- Facial Fractures
- Maxillo-Mandibular Fixation

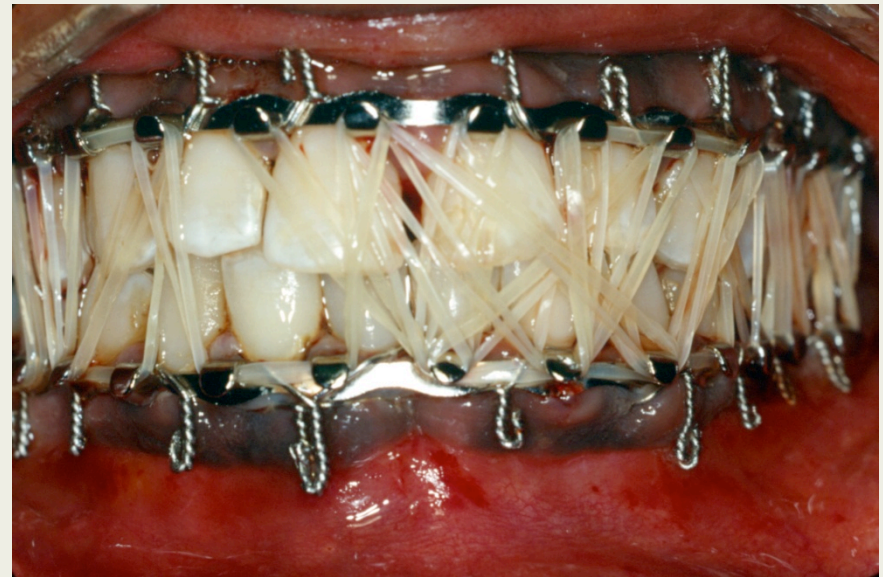


- Serves as stable base
- 2-6 week healing process

Current Procedure – Archbar and Wire Ligature



- Archbar
 - 24 Gauge Wire ligature
 - Safety and sanitary concerns



Barton Bandage



- **Uses**

- Transportation of injured patients
- Night-time transition from fixed jaw
- Overnight when no OR available

- **Current Method**

- Ace Bandage
- Non-reusable
- Inefficient application

Barton's Bandage



A Barton's bandage is used to temporarily stabilize the jaw after a fracture.

Problem Statement



- New ligature material and/or method
- Eliminate injury risk
- Strength and stability
- 2-6 weeks
- Transportation device
- Easy application

Requirements - Transportation Device



- **Jaw force vectors vertical**
- **Secured in occlusion**
 - no significant force from sides
- **Comfortable straps**
 - avoid irritating injured areas
- **Used for up to 12 hours**



Designs



- **Current Design**
 - Sleep apnea or snoring



Our Design



- Adjustable chin piece
- Adjustable upper straps
 - Rubber or silicone lining
- Comfortable lining to avoid irritation

Ligature



- **Current**
 - Uses 24 gauge stainless steel wire
 - Twists to tighten
 - Cuts off to remove
 - Pushes through teeth
 - ✦ One end over & under archbar



Ligature - Client Specifications



- **Durable**
 - Maintain strength for 2-6 weeks
 - Withstand continuous pressure
 - Rigid
- **Safe**
 - Comfortable
 - Bio-safe (non-corrosive)
 - Not puncture doctor's finger

Design Matrix



	24 Gauge steel wire	Suture material	Zip ties
Strength (20)	20	18	19
Safety (30)	15	30	30
Ease of application (20)	18	16	19
Ease of removal (20)	17	12	17
Patient comfort (10)	5	7	5
Total (100)	75	83	90

Future Work



- **The Sling Jaw**

- Test the current prototypes
- Research and decide the “Sling Jaw” material
- Manufacture



Future Work Cont.



- Replacing the “24 Gage wire”
 - Explore possibilities with “Sutures”
 - ✦ Types of knots and sutures
 - Nylon zip ties

Questions

