



# The Use of L-PRF to Reduce MRONJ Risk After Full-mouth Extraction

## A Case Report

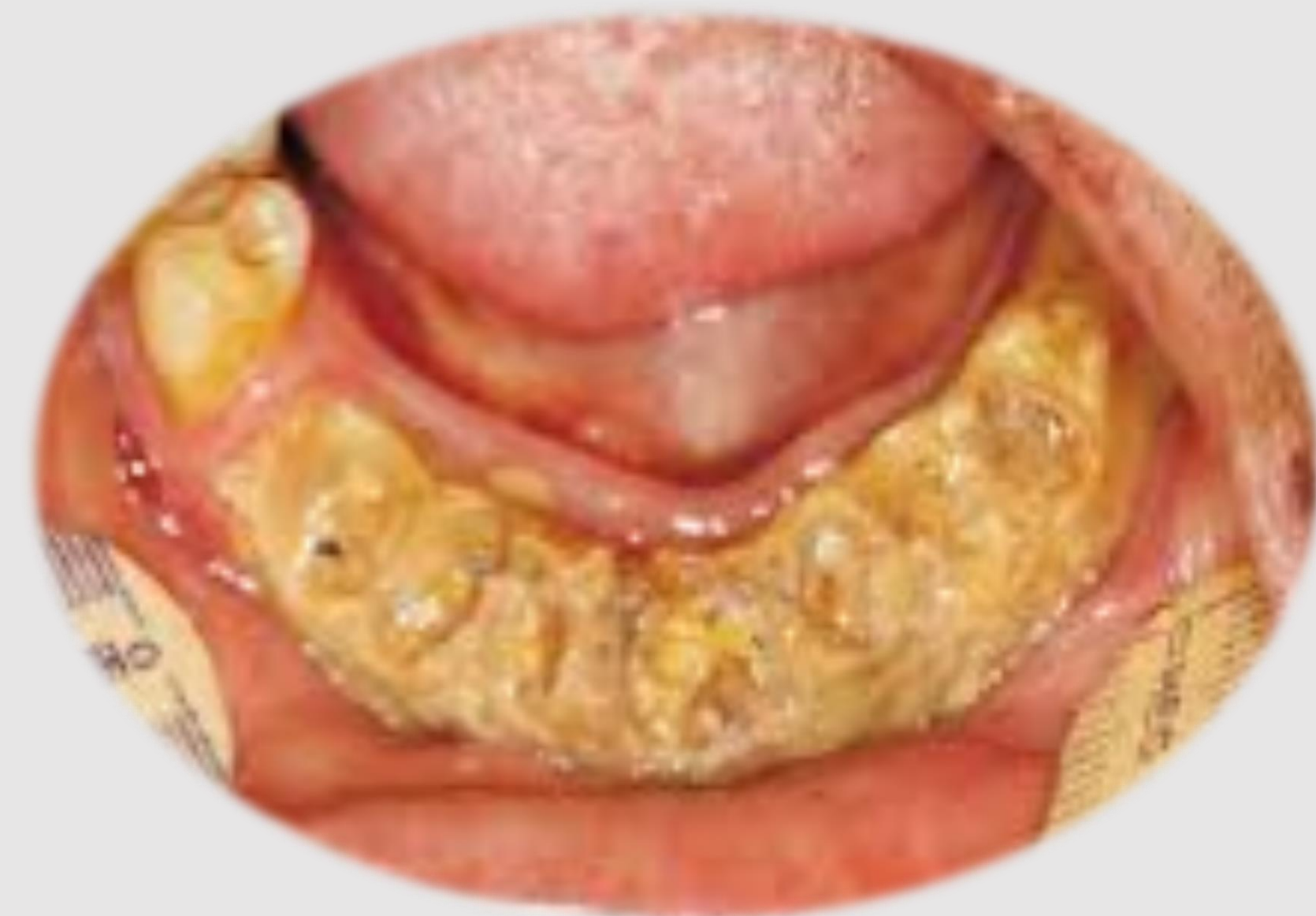
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### Background

“**MRONJ**” or **Medication Related Osteonecrosis of the Jaw** is a severe adverse reaction characterized by non-healing exposed bone in a patient with a history of antiresorptive or antiangiogenic agents. This complication occurs after extractions or any bone-related oral surgery.

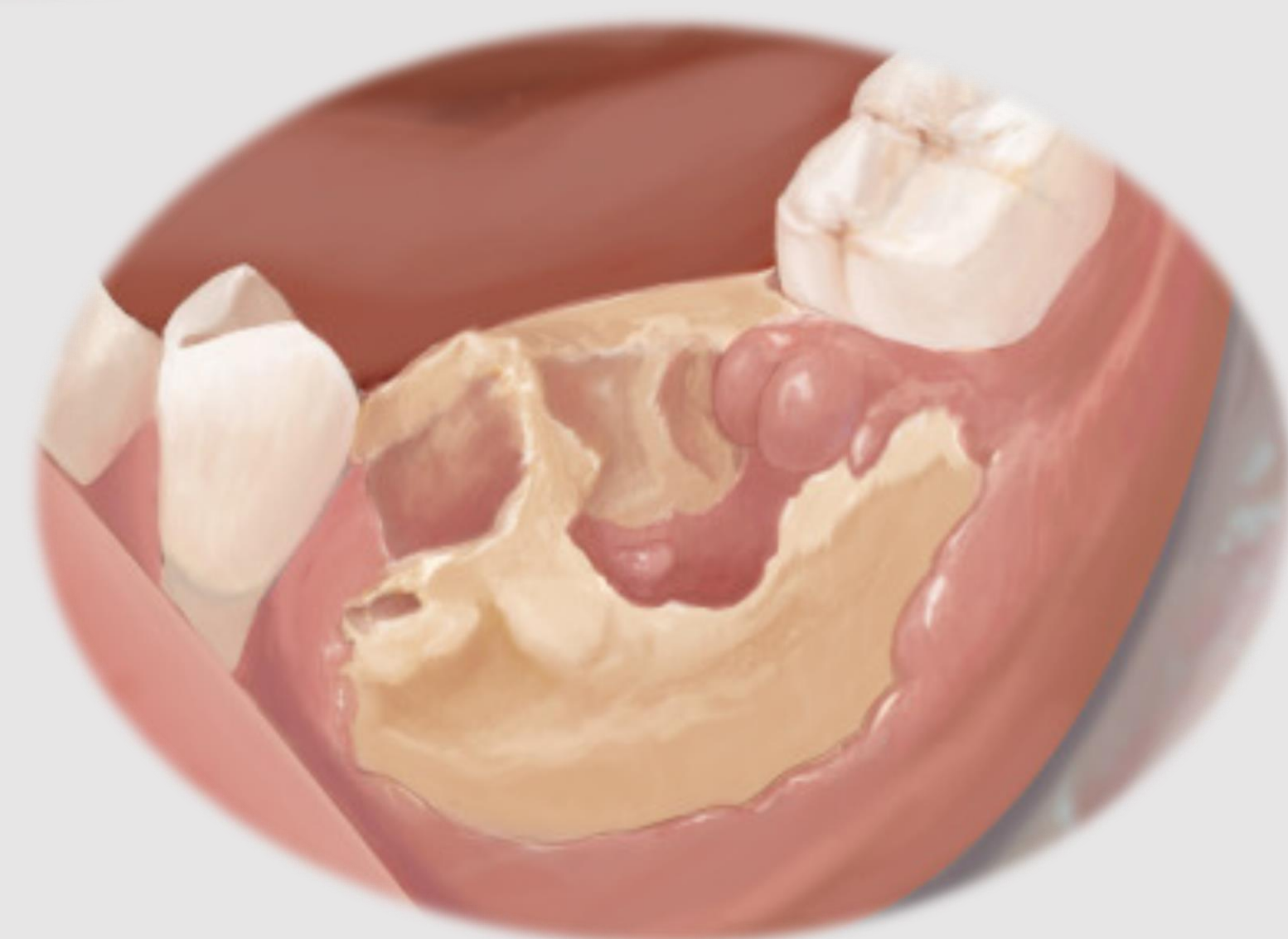
#### **Pathophysiology of MRONJ**

- Inflammatory processes
- Lack of immune resiliency
- Altered angiogenesis.
- Altered bone remodeling
- Soft-tissue toxicity



#### **Effect of Bisphosphonate on tissues:**

- Cytotoxic effect on fibroblasts and keratinocytes while inhibits osteoclasts and impairing osteoblast function.
- Direct inhibition of wound healing and impaired mucosal function.



### Antiresorptive drugs guidelines

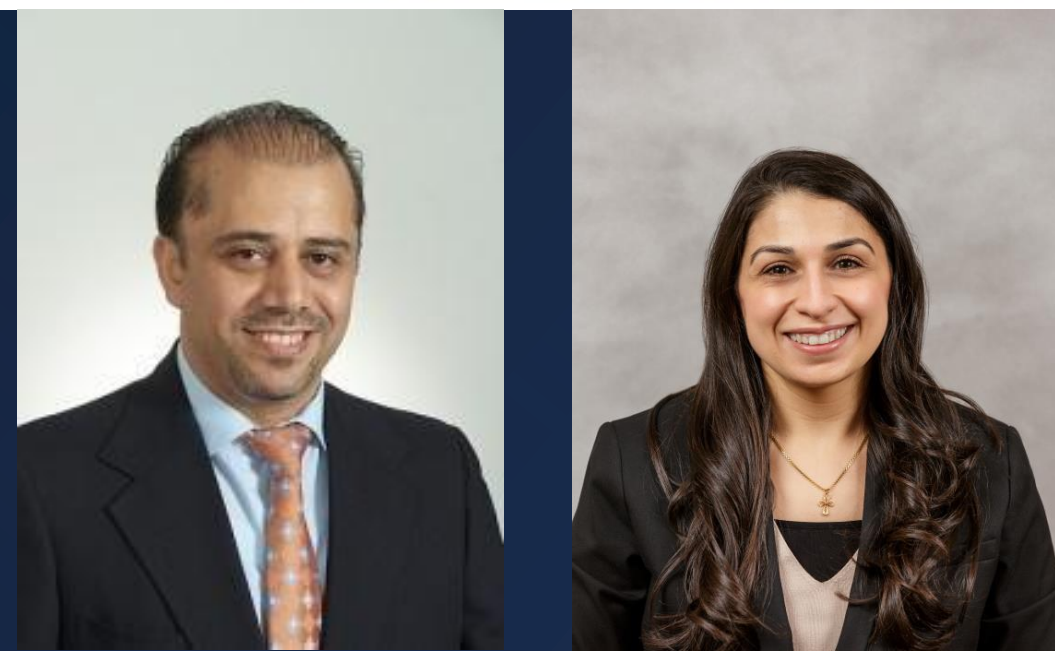
| Medication                  | Formulation                                                                                          | Indication      | Mechanism of action                                                              | Drug holiday                                                                                                |
|-----------------------------|------------------------------------------------------------------------------------------------------|-----------------|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| <b>IV Bisphosphonates</b>   | Zolendronate ( <b>Reclast®</b> )                                                                     | Bone metastases | It inhibits osteoclast proliferation and induces osteoclast apoptotic cell death | Schedule <b>surgery two months after infusion</b> . This allows 10 months of healing prior to next infusion |
|                             | Pamidronate ( <b>Aredia®</b> )                                                                       | Osteoporosis    |                                                                                  |                                                                                                             |
| <b>Oral Bisphosphonates</b> | Alendronate ( <b>Fosamax®</b> )<br>Risedronate ( <b>Actonel®</b> )<br>Ibandronate ( <b>Boniva®</b> ) | Osteoporosis    |                                                                                  | <b>Two-months</b> drug holiday before invasive dental procedure                                             |

### Several protocols for the prevention of MRONJ have been proposed, including:

- Antibiotic prophylaxis
- Antiseptic rinses
- Primary closure of the extraction socket
- Drug holiday
- Ozone therapy
- Use of autologous platelet concentrates

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**Leukocytes-platelets Rich Fibrin “L-PRF”** is a second-generation PRP where autologous platelets and leukocytes are present in a complex fibrin matrix to accelerate the healing of soft and hard tissue.

### L-PRF Components/Function.

PRF contains a substantial quantity of fibrin, platelets, and leukocytes. Dense fibrin networks of PRF provide a natural matrix scaffold for the [storage](#) and [attachment](#) of tissue cells and stimulation of [angiogenesis](#).

Activated platelets enmeshed in the fibrin provide and sustain the release of many [growth factors](#) (platelet-derived growth factor, fibroblast growth factor, epithelial growth factor, vascular endothelial growth factor, and transforming growth factor- $\beta$ ) Also, increase [cell proliferation](#) in osteoblasts, and periodontal ligament fibroblasts.

These [key growth factors](#) are released for at least [1-week and up to 28 days](#) during wound healing.

### Use L-PRF in extraction sockets in patients on Bisphosphonate.

Studies revealed that [early mucosal epithelization](#) was observed with PRF utilization, suggesting that the effects of PRF competed with the suppression of mucosal cells and inhibition of osteoclastic activity induced by the oral BPs.

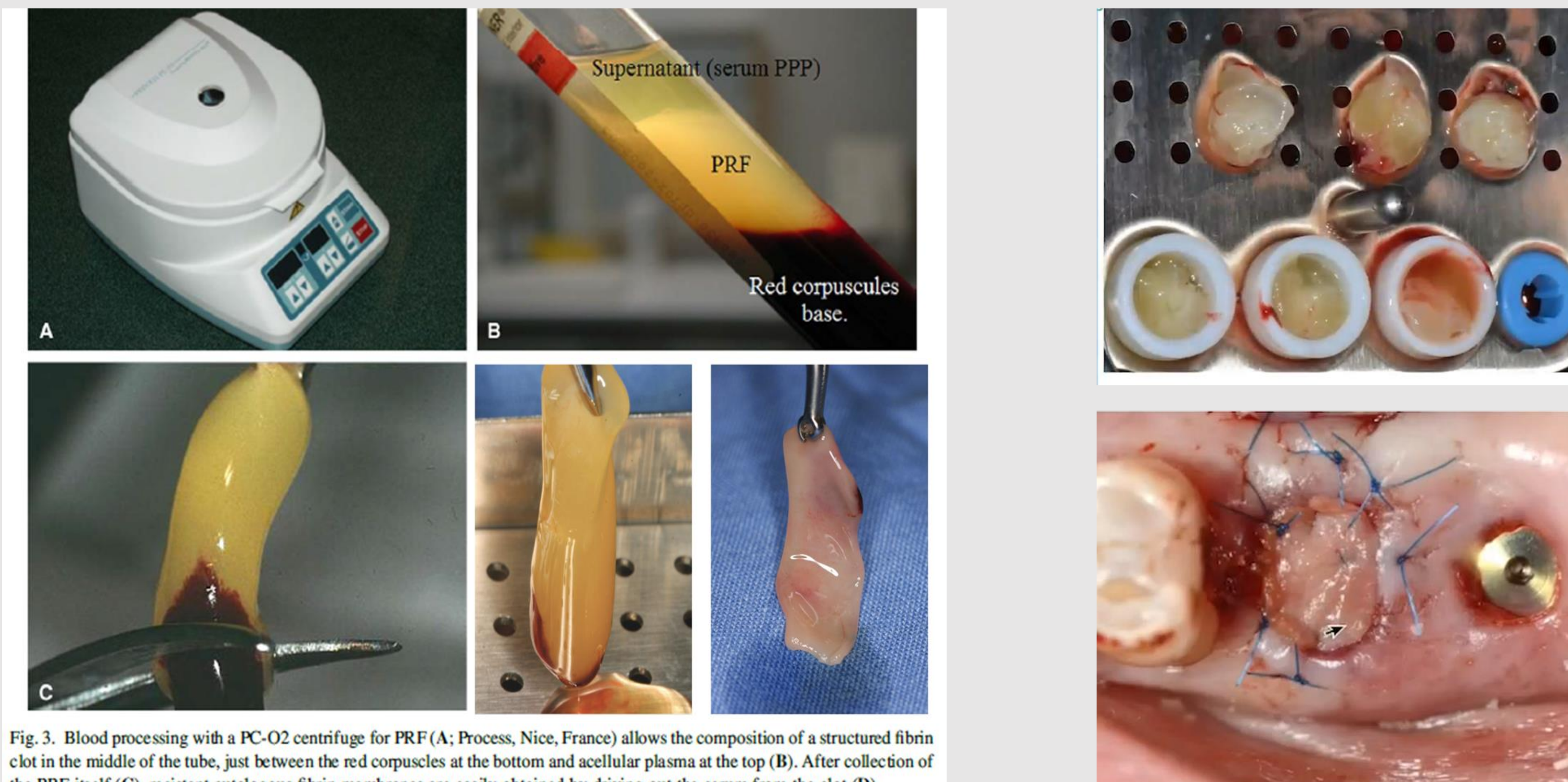


Fig. 3. Blood processing with a PC-O2 centrifuge for PRF (A; Process, Nice, France) allows the composition of a structured fibrin clot in the middle of the tube, just between the red corpuscles at the bottom and acellular plasma at the top (B). After collection of the PRF itself (C), resistant autogenous fibrin membranes are easily obtained by dividing out the serum from the clot (D).

**The aim of this case report:** To document on the use of L-PRF during a full mouth extraction in a patient receiving IV bisphosphonates. This approach may serve to prevent/reduce complications associated with Medication-Related Osteonecrosis of the Jaw (MRONJ) in elderly patients.



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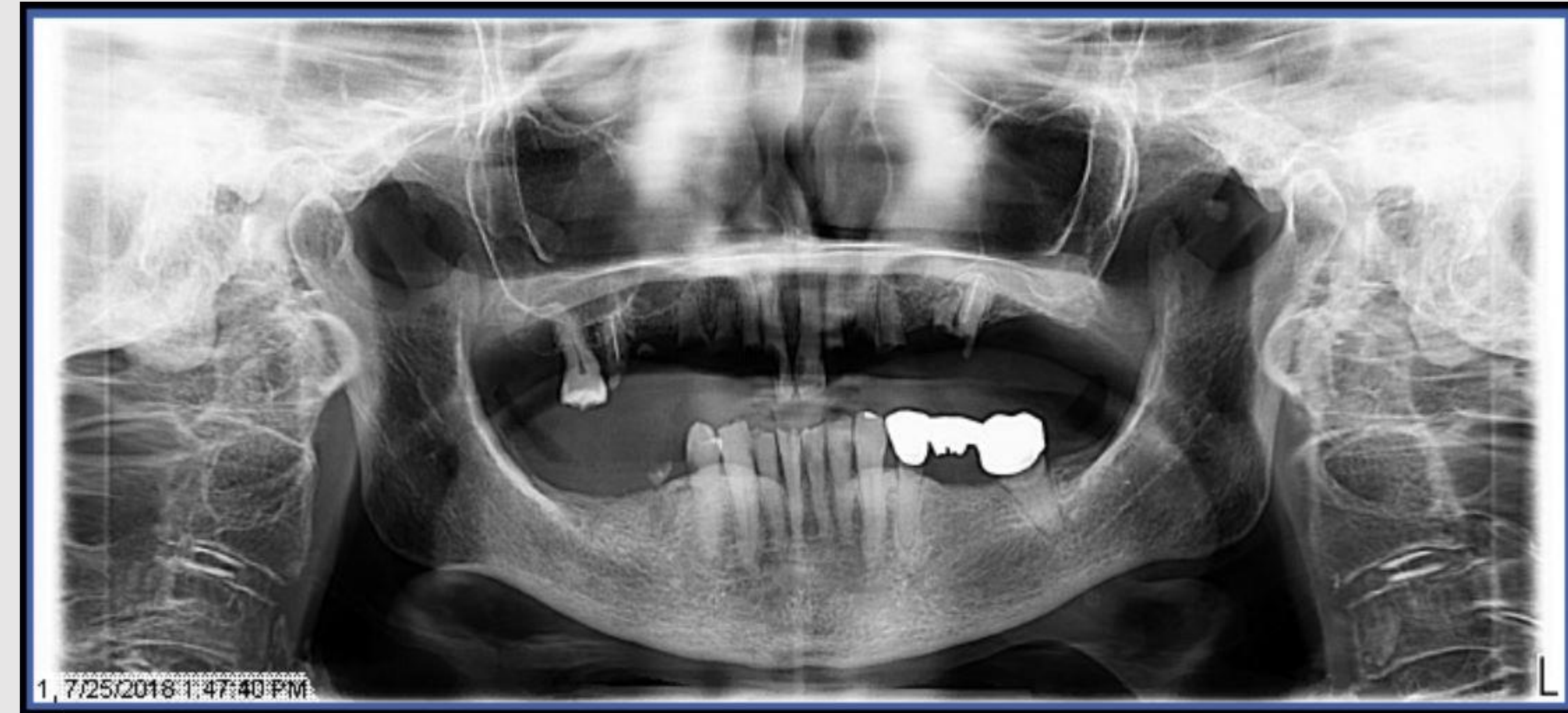
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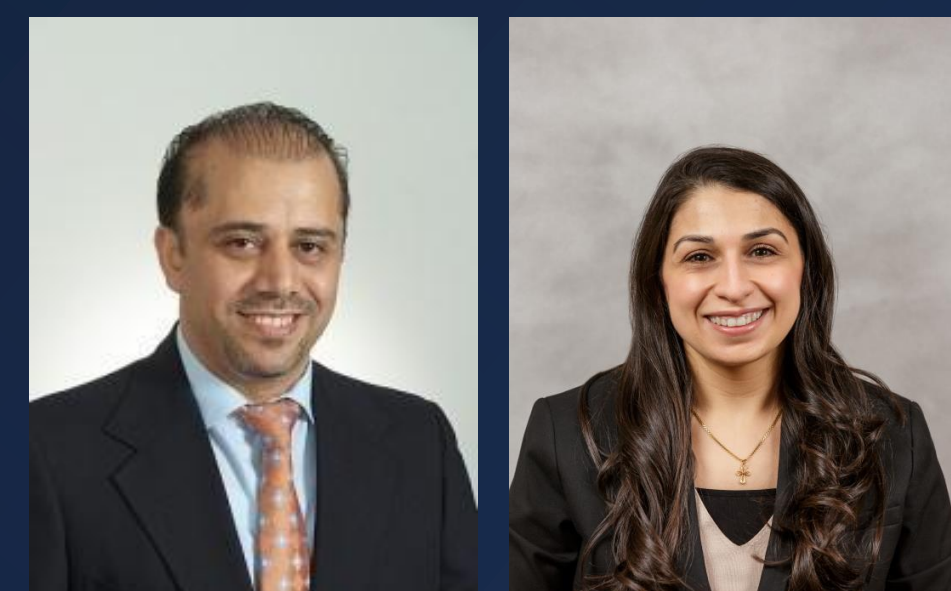
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### Case review

#### Patient History:

- 79-Years old female
- chief complain: “I lost few teeth over the last few years, and now some are breaking, I am in pain and want to get them out.”
- Medical history: Asthma, GERD, **Osteoporosis**.
- Medications: **Reclast infusion** once a year for osteoporosis for 10 years duration (last dose was 4-month prior her visit), while **oral bisphosphonate** was taken for 30 years prior IV.
- Social History: Non-smoker.
- Clinical examination: Extensive carious lesions with fractured teeth, collapsed vertical dimension of occlusion, no signs of swelling or infection noted.
- Radiographs: Generalized moderate bone loss with several remaining roots and advanced carious teeth.
- Risk factors: Increased MRONJ risk due to extensive use of Bisphosphonates “30-years orally followed by 10-years intravenous”.
- Medical consult obtained to wait 10-months following the procedure prior the next “Reclast” dose.
- Patient comprehended the associated risks and expresses a desire to proceed with the treatment due to difficulties in eating and the onset of tooth pain.





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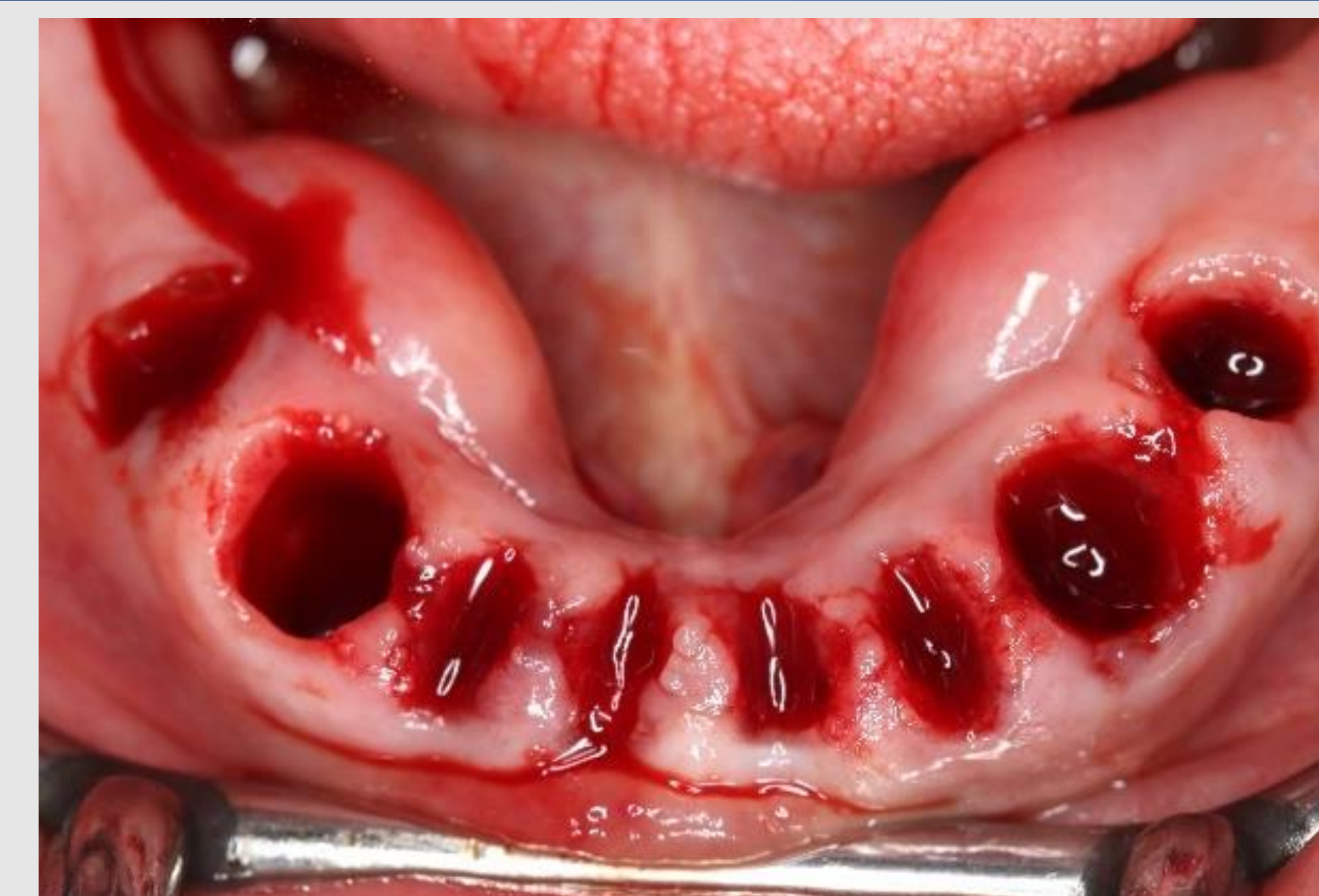
### Clinical Procedures:

**Treatment was staged through 3 consecutive visits.**

**On the day of each procedure:**

- Reviewed Pt. medical conditions, vital signs within normal limit
- Patient's blood was harvested from her antecubital fossa and centrifuged according to the protocol to obtain L-PRF
- Teeth and remaining roots were atraumatically extracted without flap reflection
- Gentle sockets debridement was performed
- L-PRF was packed into the sockets
- A 5-0 chromic gut interrupted, and crisscross sutures were used to secure the PRF inside the sockets

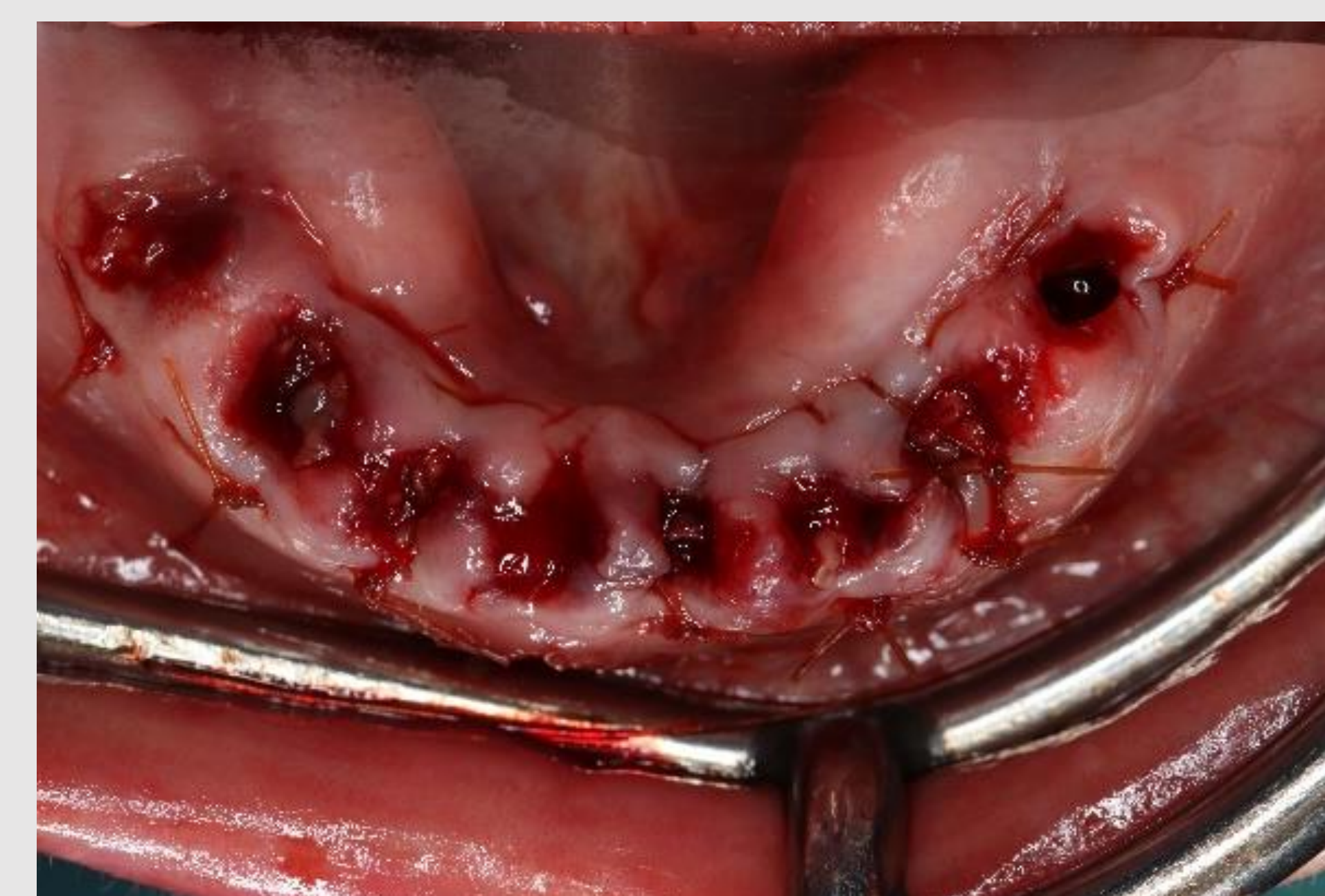
*1-Atraumatic  
Extraction*



*2- L-PRF  
Placement*

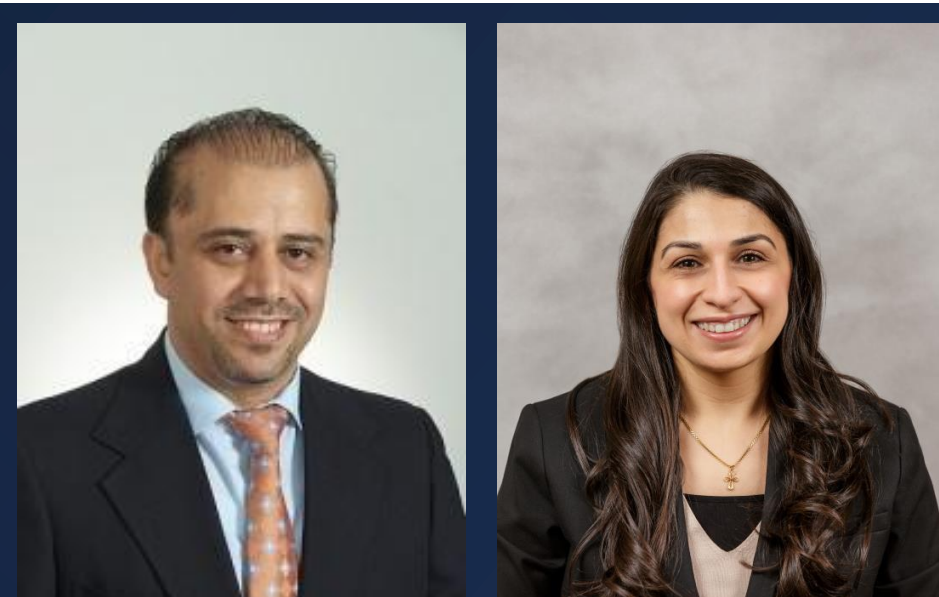


*3- Sockets  
sutured with a  
5-0 chromic gut*



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**2-weeks follow up**, patient revealed normal tissue healing with no complications.

Extraction of the left maxillary teeth was done at the 2-weeks visit.



**2-months follow up** : Tissue was pink and healthy and there were no signs of infection.

**3-months follow up** : Patient shows complete healing with no complications, Patient was getting ready for starting her maxillary and mandibular complete denture process.

## Conclusion:

Upon several literature and case reports throughout the years including this one, L-PRF seems to be useful in preventing and reducing risk of MRONJ with patients who have long or extensive history of Bone-sparing Medication especially Bisphosphonates use.

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