### Dental Student PBL III

Mrs. Jones, a 59-year-old patient, lost her first and second molars (#18, 19, 30, 31) six years ago and has been using a mandibular removable partial denture since then. She decided and had implant surgery 5 months ago. When implants were uncovered, clinical inspection revealed that implants replacing #18,19 and 30 had failed to osteointegrate. The implants were mobile and had a fibrous connective tissue encapsulating them. She had fractured her left wrist 4 months ago; it is still not fully healed according to the orthopedic surgeon. She had a regular physical check up two years ago but has not seen her physician lately. Recently, she has been an experiencing back pain and headache localized in the temple region; OTC medication seems to help. You suggest that Mrs. Jones go to her internist and have complete physical examination including serology. Mrs. Jones was suspected of suffering from either osteomalacia or osteoporosis. Serology tests showed: Blood glucose (>150 mg %); Lower than normal serum calcium; Lower than normal serum phosphorus; Elevated PTH levels; Elevated alkaline phosphatase levels.

1. What conditions might lead to loss of molars at such a young age?

2. What is the process and mechanism of osteointegration?

3. What types of collagens are present in the bone and what is the process of bone formation?

4. Is a 4-month too short an interval for bone to heal and if so what might be the problem with this repair process?

5. Are symptoms of headaches in the temple region an indication of lack of osteointegration? If so what type of OTC medications might help and what is the mechanism of their action at the biochemical level?

6. Is there any significance to the plasma glucose of 150 mg%?

7. What can be deduced from observed lower than normal plasma calcium and phosphate levels in this patient?

8. Under what conditions is the level of serum PTH elevated and what is the biochemical mechanism of PTH release?

9. Why would the plasma levels of alkaline phosphatase go up in this patient and what is the function of alkaline phosphatase in the process of bone formation?

10. What are distinguishing features of osteoporosis and Osteomalacia?

11. What procedures/tests should have been performed before the implantation procedure?

## Reading Material

http://courses.washington.edu/bonephys/hypercalU/opmal2.html

<http://chorus.rad.mcw.edu/doc/00906.html>

http://courses.washington.edu/bonephys/

In addition get information from your text book.