Facoltà di Medicina e Chirurgia San Luigi Gonzaga – Torino

S.C.D.U. di ODONTOSTOMATOLOGIA

Scuola di specializzazione in chirurgia odontostomatologica

direttore Prof S.Gandolfo

Chirurgia orale e maxillo-facciale

resp . E. Pomatto

OSTEONECROSI DEI MASCELLARI (ONJ): PREVENZIONE, DIAGNOSI, TRATTAMENTO UPDATE 2010

Alessandria, 5 giugno 2010

TERAPIA CHIRURGICA NON ESTESA
update della letteratura

Eraldo Pomatto

Franco Motta

TERAPIA CHIRURGICA NON ESTESA

quando utilizzare la terapia chirurgica ?

che cosa si intende per terapia chirurgica non estesa?

American Association of Oral and Maxillofacial Surgeons Position Paper on Bisphosphonate-Related Osteonecrosis of the Jaw – 2009 Update

Approved by the Board of Trustees January 2009

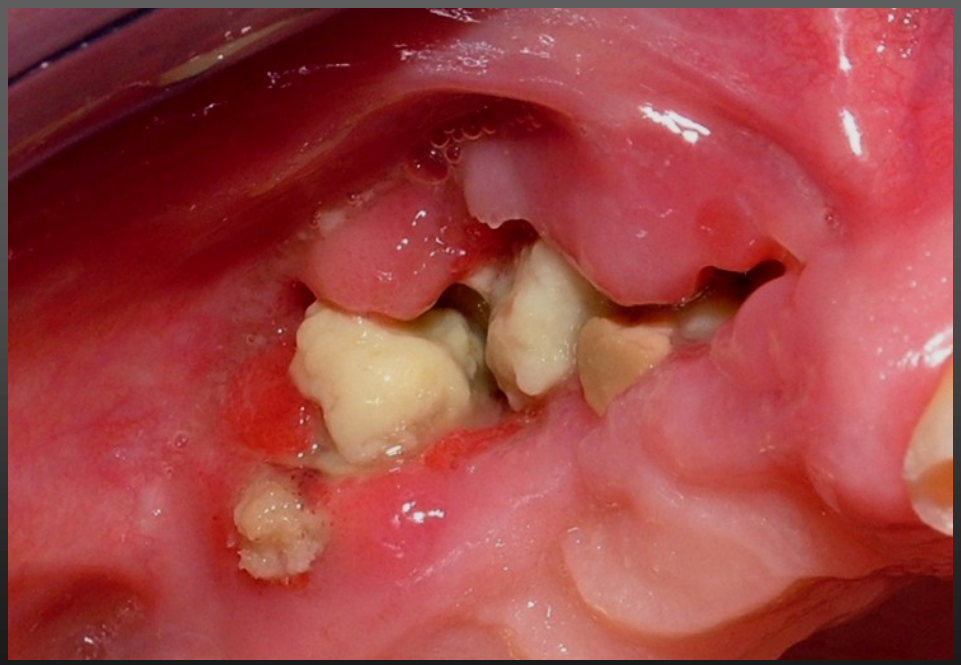
Task Force on Bisphosphonate-Related Osteonecrosis of the Jaws*

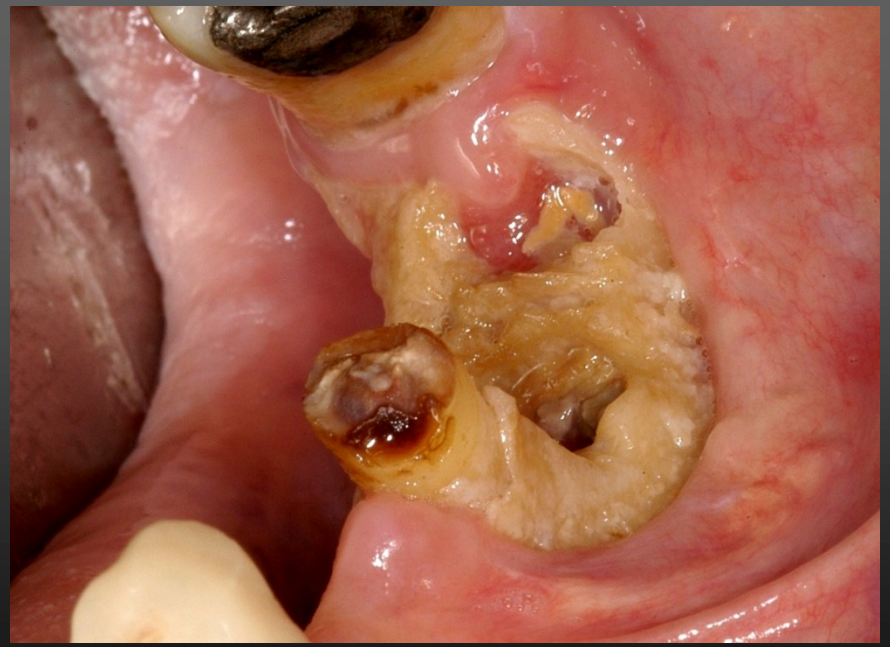
Table 1 Staging and treatment strategies

BRONJ† staging	Treatment strategies‡
At risk category: No apparent necrotic bone in patients who have been treated with either oral or IV bisphosphonates	No treatment indicated Patient education
Stage 0: No clinical evidence of necrotic bone, but non-specific clinical findings and symptoms	Systemic management, including the use of pain medication and antibiotics
Stage 1: Exposed and necrotic bone in patients who are asymptomatic and have no evidence of infection	Antibacterial mouth rinse Clinical follow-up on a quarterly basis Patient education and review of indications for continued bisphosphonate therapy
Stage 2: Exposed and necrotic bone associated with infection as evidenced by pain and erythema in the region of the exposed bone with or without purulent drainage	Symptomatic treatment with oral antibiotics Oral antibacterial mouth rinse Pain control Superficial debridement to relieve soft tissue irritation
Stage 3: Exposed and necrotic bone in patients with pain, infection and one or more of the following: exposed and necrotic bone extending beyond the region of alveolar bone (i.e. inferior border and ramus in the mandible, maxillary sinus and zygoma in the maxilla) resulting in pathologic fracture, extra-oral fistula, oral antral/oral nasal communication, or osteolysis extending to the inferior border of the mandible of sinus floor	Antibacterial mouth rinse Antibiotic therapy and pain control Surgical debridement/resection for longer term palliation of infection and pain

Conservative treatment with antiseptic rinses, intermittent or long-term use of antibiotics and analgesic remains the mainstay therapy

Ruggiero SL, Fantasia J, Carlson E. Bisphosphonate-related osteonecrosis of the jaw: background and guidelines for diagnosis, staging and management. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2006; 102:433–441.





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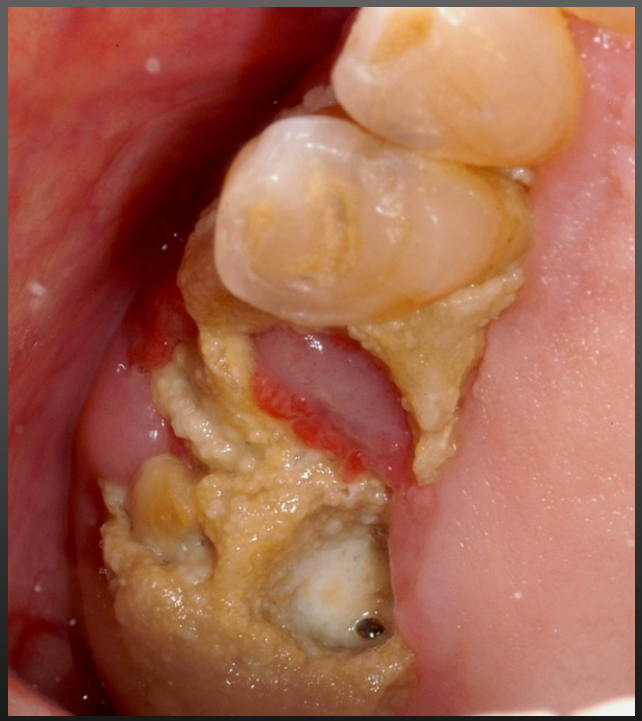

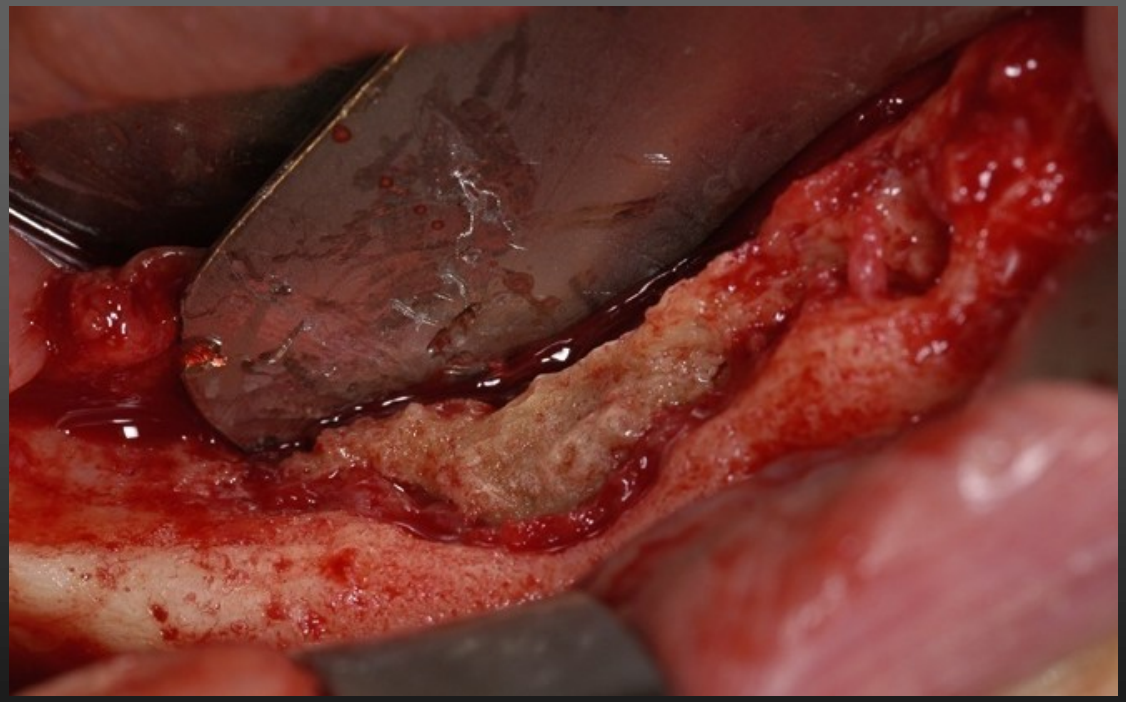

Disclaimer

The AAOMS is providing this position paper on BRONJ to inform practitioners, patients and other interested parties. The position paper is based on a review of the existing literature and the clinical observations of an expert Task Force composed of oral and maxillofacial surgeons and oncologists experienced in the diagnosis, surgical and adjunctive treatment of diseases, injuries and defects involving both the functional and esthetic aspects of the hard and soft tissues of the oral and maxillofacial regions, epidemiologists and basic researchers.

The position paper is informational in nature and is not intended to set any standards of care. AAOMS cautions all readers that the strategies described in the position paper are NOT practice parameters or guidelines and may NOT be suitable for every, or any, purpose or application. This position paper cannot substitute for the individual judgment brought to each clinical situation by the patient's oral and maxillofacial surgeon. As with all clinical materials, the position paper reflects the science related to BRONJ at the time of the paper's development, and it should be used with the clear understanding that continued research and practice may result in new knowledge or recommenda-

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The Role of Surgical Resection in the Management of Bisphosphonate-Related Osteonecrosis of the Jaws

Eric R. Carlson, DMD, MD, and John D. Basile, DMD†*

Purpose: Bisphosphonate-related osteonecrosis of the jaws (BRONJ) is a poorly understood pathologic entity from the standpoints of its nomenclature, frequency, pathogenesis, and best method of treatment. In particular, numerous recommendations have been made for treatment involving nonsurgical therapy. It is the purpose of this article to specifically examine the success of resection of the necrotic bone in the mandible and maxilla in these patients.

Patients and Methods: We identified 103 sites of BRONJ in 82 patients. Of these sites of osteonecrosis, 32 were in the maxilla and 71 were in the mandible. Of the patients, 30 were taking an oral bisphosphonate medication whereas 52 were taking a parenteral bisphosphonate medication. Resection was performed in 95 sites of osteonecrosis in 74 patients, whereas 8 sites diagnosed in 8 patients were not resected. A total of 27 sites of BRONJ were resected in patients treated with oral bisphosphonates, and 68 sites of BRONJ were resected in patients treated with parenteral bisphosphonates.

Results: Of the 95 resected sites, 87 (91.6%) healed in an acceptable fashion with resolution of disease. Of 27 resected sites in patients taking an oral bisphosphonate medication, 26 (96.3%) healed satisfactorily, with refractory disease developing in 1 site. Of 68 resected sites in patients taking a parenteral bisphosphonate medication, 61 (89.7%) healed satisfactorily, with refractory disease developing in 7 sites. All 29 patients (100%) undergoing resection of the maxilla related to either an oral or parenteral bisphosphonate healed acceptably. The 8 patients who had the development of refractory disease did so with a range of 7 to 250 days postoperatively (mean, 73 days). Of the 8 sites of refractory disease, 6 developed after a marginal resection of the mandible for BRONJ. Three sites of new primary disease developed in 2 patients postoperatively. Both patients were taking a parenteral bisphosphonate medication. Histologic examination of the resected specimens identified malignant disease in 4 specimens in 3 patients.

Conclusion: Resection of BRONJ permits acceptable healing in patients taking an oral bisphosphonate medication. In addition, resection of BRONJ of the maxilla in patients taking an oral or parenteral bisphosphonate medication follows a predictable course with regard to healing. Resection of BRONJ of the mandible in patients taking a parenteral bisphosphonate medication follows a variable postoperative course, although a high degree of success is realized. Surgeons should consider resection of necrotic bone of the maxilla and mandible that develops in patients taking bisphosphonate medications. In addition, refractory disease can be successfully managed with a more aggressive resection, specifically, a segmental resection of the mandible after a marginal resection of the mandible where refractory disease developed.

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The presence of metastatic bone deposits in cancer patients often results in complications including hypercalcemia, pain, pathologic fracture, and spinal cord compression. Although their precise mechanism of action is unclear, bisphosphonate medications have been shown to be potent inhibitors of osteoclast-mediated

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jaw bones is used in this article. Specifically, mandibular resections are referred to as *segmental resections* where mandibular continuity is broken and reconstructed with bone plates and *marginal resections* where the alveolus is resected without loss of mandibular continuity. Marginal resections of the mandible were performed when clinical and radiographic examinations identified necrotic bone isolated to the alveolus of the mandible (Fig 1). Segmental resections were performed when extensive necrotic bone was present in the mandible approaching or involving the basal bone or when an orocutaneous fistula was present (Fig 2). In the maxilla partial maxillectomies were performed in all patients (Fig 3). The terms *debridement* and *sequestrectomy* are not described in this article. These procedures typically involve conservative removal and curettage of necrotic bone without the intention of including a margin of normal surrounding bone. Given the likelihood of incomplete

an oral bisphosphonate medication and all 29 sites (100%) in patients undergoing resection of the maxilla. Resolution of disease was defined as maintenance of the mucosal closure without signs of residual infection or exposed bone at the time of evaluation. Of the 68 sites resected in patients who had been treated with Aredia or Zometa, 61 (89.7%) showed acceptable healing and resolution of their disease after surgery. Osteonecrosis of the mandible was observed in 3 patients taking a parenteral bisphosphonate and 1 patient taking an oral bisphosphonate, primarily because of poor systemic health. Serial clinical and radiographic examinations showed no resolution of their disease. In 1 patient treated with a single dose of Aredia in whom exposed, necrotic bone developed, spontaneous healing was realized. One elderly patient treated with Fosamax had extensive yet asymptomatic disease in the mandible such that observation was thought to be appropriate. One patient taking Fosa-

Table 1. PATIENT DATA

	No. of Patients
Total	82
Male	24
Female	58
Bisphosphonate medication	
Patients taking oral bisphosphonates	30
Fosamax	25
Fosamax followed by Actonel	2
Actonel	3
Patients taking parenteral bisphosphonates	52
Zometa	29
Aredia	10
Aredia followed by Zometa	10
Zometa followed by Aredia	2
Aredia followed by Zometa followed by Aredia	1
No. of sites of osteonecrosis diagnosed	103
Mandible	72
Oral bisphosphonates	19
Parenteral bisphosphonates	53
Maxilla	31
Oral bisphosphonates	12
Parenteral bisphosphonates	19
Stage at diagnosis	
Stage I	54
Stage II	33
Stage III	16
No. of sites of osteonecrosis resected	95
Mandible	66
Oral bisphosphonates	17
Parenteral bisphosphonates	49
Maxilla	29
Oral bisphosphonates	10
Parenteral bisphosphonates	19
Stage resected	
Stage I	50
Stage II	32
Stage III	13
Oral bisphosphonate resections	27
Maxilla	10
Mandible	17
Segmental	1
Marginal	16
Parenteral bisphosphonate resections	68
Maxilla	19
Mandible	49
Segmental	18
Marginal	31

Carlson and Basile. Surgical Resection and BRONJ. J Oral Maxillofac Surg 2009.

panoramic radiograph as well as axial and coronal computed tomograms. All mandibular and maxillary resections were performed with general anesthesia under sterile conditions in an operating room. Standardized terminology to describe the resections of the jaw bones is used in this article. Specifically, mandibular resections are referred to as *segmental resections* where mandibular continuity is broken and reconstructed with bone plates and *marginal resections* where the alveolus is resected without loss of mandibular continuity. Marginal resections of the mandible were performed when clinical and radiographic examinations identified necrotic bone isolated to the alveolus of the mandible (Fig 1). Segmental resections were performed when extensive necrotic bone was present in the mandible approaching or involving the basal bone or when an orocutaneous fistula was present (Fig 2). In the maxilla partial maxillectomies were performed in all patients (Fig 3). The terms *debridement* and *sequestrectomy* are not described in this article. These procedures typically involve conservative removal and curettage of necrotic bone without the intention of including a margin of normal surrounding bone. Given the likelihood of incomplete removal of the necrotic bone when a margin is not included, these procedures are not recommended for use in the surgical management of patients with BRONJ. Prophylactic antibiotics were administered intravenously and consisted of 2 million units of aqueous penicillin G in nonallergic patients who were undergoing isolated transoral surgery or 600 mg of intravenous clindamycin (Cleocin; Pfizer, New York, NY) in patients who reported a history of hypersensitivity to penicillin. We administered 1.5 g of ampicillin/sulbactam (Unasyn; Pfizer) intravenously to non-

Results

Of the 95 sites resected, 87 sites (91.6%) healed in a satisfactory fashion with resolution of disease, including 26 of 27 sites (96.3%) in patients taking an oral bisphosphonate medication and all 29 sites (100%) in patients undergoing resection of the maxilla. Resolution of disease was defined as maintenance of the mucosal closure without signs of residual infection or exposed bone at the time of evaluation. Of the 68 sites resected in patients who had been treated with Aredia or Zometa, 61 (89.7%) showed acceptable healing and resolution of their disease after surgery. Osteonecrosis of the mandible was observed in 3 patients taking a parenteral bisphosphonate and 1 patient taking an oral bisphosphonate, primarily because of poor systemic health. Serial clinical and radiographic examinations showed no resolution of their disease. In 1 patient treated with a single dose of Aredia in whom exposed, necrotic bone developed, spontaneous healing was realized. One elderly patient treated with Fosamax had extensive yet asymptomatic disease in the mandible such that observation was thought to be appropriate. One patient taking Fosamax had spontaneous exfoliation of the sequestrum of the maxilla with maintenance of mucosal coverage, and in one patient taking Fosamax, osteonecrosis of the maxilla was observed because she refused to undergo surgery. This final patient had partial yet incomplete exfoliation of the necrotic bone in the maxilla with persistence of the wound.

Of the patients, 8 showed the presence of refractory disease at 8 sites in the mandible with a range of 7 to 250 days (mean, 73 days) postoperatively (Table 2). Refractory disease presented as exposed bone at

Outcome of Surgical Management of Bisphosphonate-Related Osteonecrosis of the Jaws: Review of 33 Surgical Cases

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Purpose: We describe our experience with surgical management of bisphosphonate-related osteonecrosis of the jaws (BRONJ).

Materials and Methods: The data included 33 BRONJ cases treated surgically by a single surgeon at the Hospital of the University of Pennsylvania.

Results: Of the 30 debridement patients, 25 (including 1 sequestrectomy patient who required formal debridement) healed completely. Of the 30 patients who underwent surgical debridement, 18 healed following this initial treatment and remained healed. Of the 4 patients requiring sequestrectomy, 3 healed after the initial treatment. Thus, 28 of 33 patients healed completely with complete mucosal coverage and elimination of pain. Four patients developed occurrence of BRONJ at a separate site. All 4 patients were treated with our surgery protocol and remain healed. Thus, 32 of 37 BRONJ occurrences have healed with our surgical debridement protocol or sequestrectomy. The follow-up range was 1 to 40 months (average 10.7).

Conclusions: The results of our case series have shown that surgical debridement can be successful in treating BRONJ.

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to nitrogen-containing bisphosphonates. By convention, this condition is now termed "bisphosphonate related osteonecrosis of the jaws" (BRONJ). A recent review of published cases showed that most cases (60%) reported have been associated with an oral surgical or dental procedure as the inciting factor, but many other cases with unclear etiologies have also been reported. The American Association of Oral and Maxillofacial Surgeons (AAOMS)[4,5] recently published recommendations in a position paper to aid in the prevention by suggesting dental evaluation and treatment before initiating therapy, similar to recommendations currently followed for patients requiring radiotherapy involving the jaws. This position paper has also reported a classification system and possible management options for established cases of BRONJ.

The relationship between bisphosphonates and BRONJ has not been completely elucidated. One theory has proposed that BRONJ is related to poor bone turnover. The inhibition of osteoclasts by bisphosphonates, not only deregulates bone resorption, but also interferes with bone generation, because the interplay between osteoblasts and osteoclasts is disrupted. Further complicating the matter is that the exact half life and potential duration of action of these agents is not clearly understood, implying that surgical intervention might perpetuate the problem. Given the current theories regarding the relationship of bisphosphonates and BRONJ, many practitioners are reluctant to treat even advanced cases of established BRONJ. It is with that in mind that we share our experience and outcomes with these cases.

Materials and Methods

A retrospective chart review was done of 51 patients with established BRONJ who were seen by a single practitioner at the Hospital of the University of Pennsylvania between October 2003 and July 2008. The data reviewed included gender, age, primary underlying diagnosis, specific bisphosphonate used, site of osteonecrosis, treatment rendered, postoperative course, and overall outcome.

The patients were considered surgical candidates if they had exposed necrotic bone and their other medical problems did not prohibit them from undergoing surgery, with a set protocol as described later. Other findings, such as clinical evidence of acute infection, oral-cutaneous fistula formation, pathologic fracture, or extensive osteolysis predisposing to pathologic fracture, were also used as additional indications for surgical intervention. Preoperative computed tomography was obtained for most patients to further delineate the extent of disease and to aid in the discussion of treatment options.

The patients who were deemed surgical candidates were treated with the following protocol:

1. Bisphosphonate therapy was stopped or interrupted for at least 2 months before the planned surgical intervention. In all cases, close consultation and coordination with the other treating physicians was necessary to minimize the effects on the other ongoing therapies, including chemotherapy for patients with active cancer. The bisphosphonate therapy was withheld for a minimum of 2 months postoperatively, or until the mucosa had healed clinically. Subsequently, some patients chose not to resume bisphosphonate therapy.
2. Four patients were treated initially with sequestrectomy under local anesthesia in an effort to provide palliative pain relief. Of the 4 patients, 3 healed after the sequestrectomy alone, and 1 required additional debridement.
3. Of the 30 patients scheduled for debridement, 29 had surgery performed with the patient under general anesthesia with endotracheal intubation to allow for thorough debridement, including removal of all obvious necrotic bone and sequestrae. Extraction of involved or questionable adjacent teeth or implants, along with saucerization and smoothing of the bone, was also done. Closure was then obtained using mucosal advancement flaps to allow for a tension-free closure. Attention was given to meticulous hemostasis, and horizontal mattress Vicryl sutures were used for tension-free closure in all cases. No vasoconstrictor was used in the local anesthetic during surgery.
4. Antibiotics were prescribed during and after surgery. Exceptions were made if active suppuration was noted at presentation, in which case, antibiotics were initiated preoperatively. Otherwise, antibiotics were initiated immediately after surgery. Levofloxacin is our antibiotic of choice and was continued for at least 4 weeks postoperatively, or until the mucosal erythema and swelling had resolved. A levofloxacin and metronidazole combination was used for patients with refractory infections. In levofloxacin allergic patients, metronidazole alone or a penicillin antibiotic was used as a second-line drug. If secondary osteomyelitis was suspected, IV antibiotics were administered for 4 to 6 weeks postoperatively. Intraoperative cultures were also obtained to guide therapy.
5. Hyperbaric oxygen was not pursued unless the area in question had also received radiotherapy. By convention, exposure to head-and-neck radiotherapy precludes the diagnosis of BRONJ.

Two patients presented with an exposed necrotic mandible that had been exposed to a bisphosphonate. Both patients had undergone previous tumoricidal head-and-neck radiotherapy. These 2 patients were not included in the 51 cases of BRONJ but have been discussed separately.

Informed discussions were undertaken with all patients regarding the unclear mechanism of the disease process. As more knowledge and publications were released, this information was shared with the patients. Once published, the AAOMS position paper was also discussed with the patients.

Results

In a retrospective review, 51 patients were identified as having the clinical diagnosis of BRONJ. The diagnosis was determined by the presence, for at least 12 weeks, of exposed necrotic bone involving the mandible or maxilla in patients who had received, or were receiving, either IV or oral bisphosphonate therapy. The BRONJ staging classification had not been published at the initiation of this case series; therefore, no staging is reported. After informed consent and medical evaluation, 33 of the 51 patients agreed to treatment and were medically stable for surgical intervention (Table 1). Of these 33 patients, 4 were treated initially with sequestrectomy under local anesthesia in an effort to provide palliative pain relief. Of these 4 patients, 3 healed after sequestrectomy alone, and 1 required additional debridement. All 33 patients who underwent surgical intervention were treated only after extensive consultation and coordination with their other treating physicians, such as their oncologist and primary care physician.

A total of 33 patients, 24 women and 9 men, with a mean age of 64.5 years (range 40 to 80) at presentation, were treated for established BRONJ in the setting of bisphosphonate therapy. The underlying diagnoses included breast cancer in 18, multiple myeloma in 5, prostate cancer in 3, non-Hodgkin's lymphoma in 1, multiple myeloma and prostate cancer in 1, osteoporosis and hypercalcemia secondary to sarcoidosis in 1, and osteoporosis in 4. Of the 33 patients, 3 had been exposed to an oral bisphosphonate (alendronate) alone. Of the 30 patients exposed to an IV bisphosphonate, 26 had received zoledronate, 1 had received pamidronate and alendronate, and 3 had received both zoledronate and pamidronate. Of the 33 patients, 25 presented with mandibular disease, with 21 involving only 1 side and 4 involving both sides of the mandible; 2 patients had maxillary involvement, in addition to the mandibular site. Finally, 8 patients presented with maxillary disease alone.

One patient had a previous pathologic fracture of the mandible with evidence of callous formation at surgery. The necrotic bone was debrided, but no additional treatment of the fracture was deemed necessary, because the bony callous appeared to be healing well despite the area of BRONJ. One other patient also presented with a pathologic fracture associated with a mandibular lesion and required maxillomandibular fixation, along with debridement of the osteonecrosis. Surgery included removal of the involved teeth or implants in 15 of 33 patients and extensive debridement in 30 of 33 patients.

Intraoperatively, the amount of necrotic bone was generally much more extensive than the amount apparent through the mucosa at the initial examination (Figs 1, 2). The demarcation between the necrotic bone and vital bone was readily apparent (Fig 2). Frequently, a rim of granulation tissue was evident between the involved and uninvolved bone. The lingual cortex of the mandible seemed to be frequently involved, with the buccal cortex involved to a lesser extent. Radiographic evaluation can be useful to guide treatment, but at times does not reflect the extent of necrotic bone (Figs 3, 4). In the maxilla, oral-antral or oral-nasal communication can be predicted from the anatomic proximity of the necrotic bone to these structures. Primary closure, using mucosal advancement flaps as needed, was obtained in all 30 patients who underwent debridement. Intraoperative tissue cultures were obtained to guide the antibiotic therapy. If an oral-antral or oral-nasal communication had occurred, local or advancement flaps were used to obtain primary closure.

Of the 30 patients who underwent initial debridement, 18 healed and remained healed. Postoperatively, 1 patient developed additional sequestering of bone that required only local wound care; 5 patients required solitary repeat debridement; 1 required 2 repeat debridements; and 1 was admitted for facial cellulitis that resolved after IV antibiotic therapy, with no BRONJ or exposed bone. Of the 30 debridement patients, 25 (including the 1 sequestrectomy patient who required formal debridement) healed completely. Of the 4 sequestrectomy patients, 3 healed after the initial treatment and 1 required additional debridement. In total, 28 of 33 patients healed completely with complete mucosal coverage and elimination of pain, with a follow-up of 1 to 40 months (average 10.7).

Four patients developed the occurrence of BRONJ at a separate site. All were treated with our surgical protocol and remain healed. Thus, 32 of 37 BRONJ occurrences healed with our surgical debridement protocol or sequestrectomy.

Of the 33 patients, 7 died of their underlying disease. Of these 7 patients, 5 had healed completely

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casistica

materiali e metodi

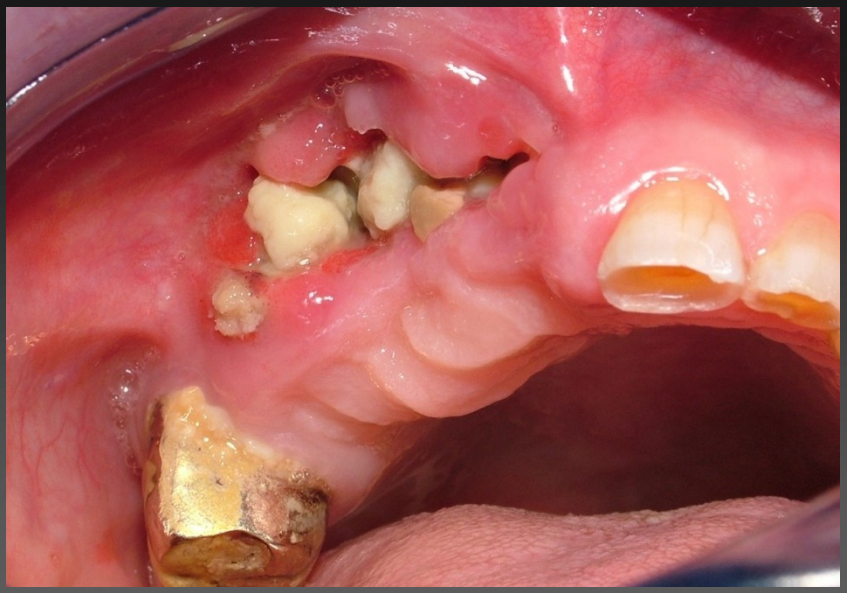
casi operati (chirurgia resettiva)	21
maschi	7
femmine	14
stadio II	17
stadio III	4

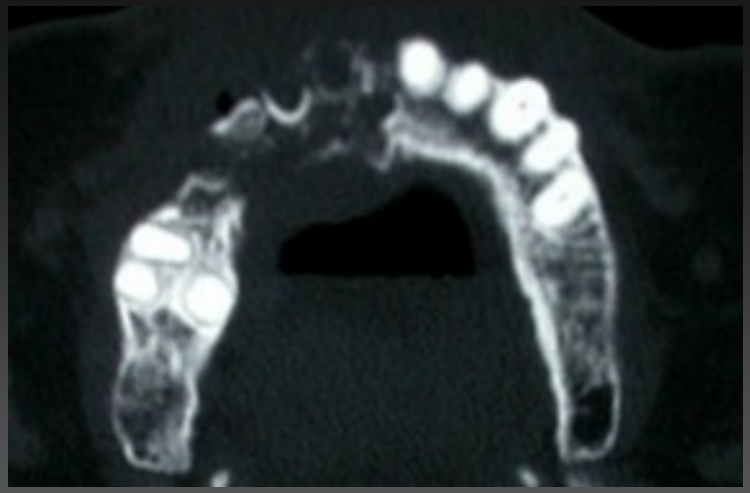
patologia di base

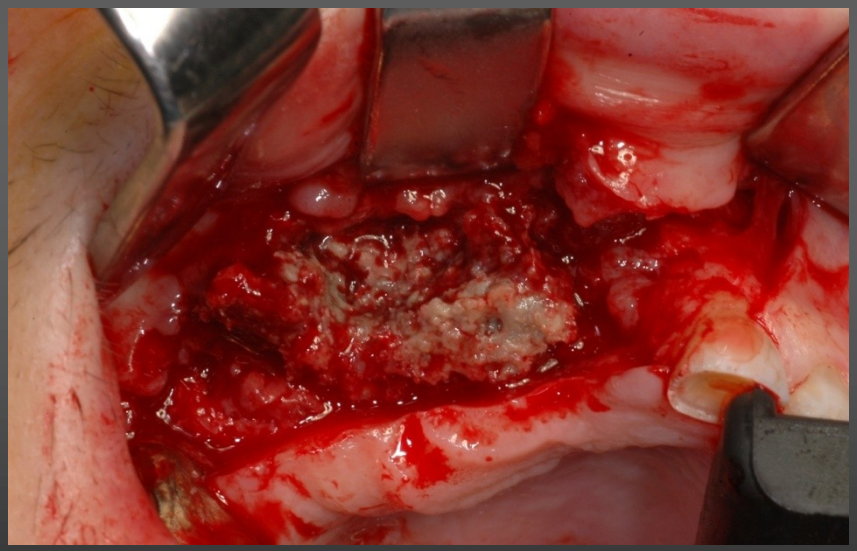
mieloma	9
ca prostata	2
ca mammella	6
artrite reumatoide	3
osteoporosi	1

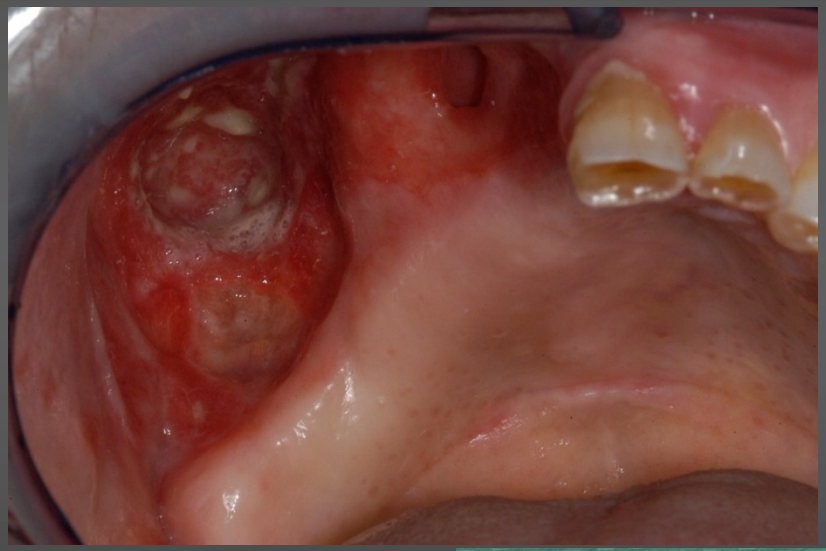
PZ	Sesso	Età	Patologia Principale	Terapia	Sede	Follow Up	Algia	Esp. Ossea	Note
B.U.	M	77	Mieloma Multiplo	Zometa	Mandibola	36 mesi	NO	NO	Deceduto
C.G.	M	70	Mieloma Multiplo	Zometa	Mandibola	18 mesi	NO	NO	Deceduto
F.R.	F	66	Mieloma Multiplo	Aredia + Zometa	Max superiore	48 mesi	NO	NO	Actinomicosi
G.T.	F	57	Mieloma Multiplo	Zometa	Mandibola	39 mesi	NO	NO	
L.S.	M	69	Ca Prostata	Zometa	Mand + Max Sup	13 mesi	NO	NO	Deceduto
R.M.R.	F	80	Ca Mammella	Zometa	Mandibola	11 mesi	NO	NO	Deceduto
R.T.	M	66	Mieloma Multiplo	Zometa	Mandibola	4 mesi	SI	SI	Deceduto
V.G.	M	68	Mieloma Multiplo	Zometa	Max superiore	55 mesi	NO	NO	
B.G.	F	53	Mieloma Multiplo	Zometa	Mandibola	24 mesi	NO	NO	Deceduto
B. R..	F	68	Ca Mammella	Zometa	Max superiore	10 mesi	NO	NO	Deceduto
B. P.	M	62	Mieloma Multiplo	Zometa	Max superiore	10 mesi	NO	NO	
R.G.M.	F	61	Ca Mammella	Zometa	Mandibola	13 mesi	NO	NO	Deceduto
G.C.	F	62	Ca Mammella	Zometa	Max superiore	4 mesi	NO	NO	

PZ	Sesso	Età	Patologia Principale	Terapia	Sede	Follow Up	Algia	Esp. Os sea	Note
F. R.	F	67	Ca Mammella	Zometa	Max superire	9 mesi	SI	SI	Deceduto
M. A.	M	55	Ca Prostata	Zometa	Mandibola	19 mesi	S	SI	
T.R.	F	75	Artrite Reum.	Alendronato	Mandibola	12 mesi	SI	SI	
B.A	F	64	Mieloma multiplo	Zometa	Mandibola	3 mesi	SI	SI	
G.C.	F	73	Osteoporosi	Alendronato	Mandibola	1 mesi	Si	Si	
C.A.	F	50	Ca mammella	Zometa	Max superiore	6 mesi	Si	Si	
G.C.	F	65	Ca mammella	Zometa	Max superiore	24 mesi	Si	Si	Deceduto
C.D.	F	72	Artrite reumatoide	Alendronato	Max superiore	50 mesi	Si	SI	
M.M.	F	66	Artrite reumatoide	Alendronato	Mandibola	2 mesi	Si	Si	

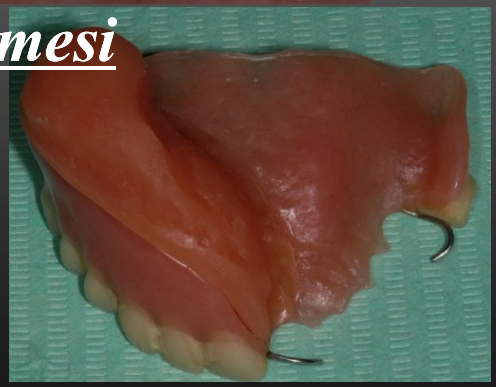


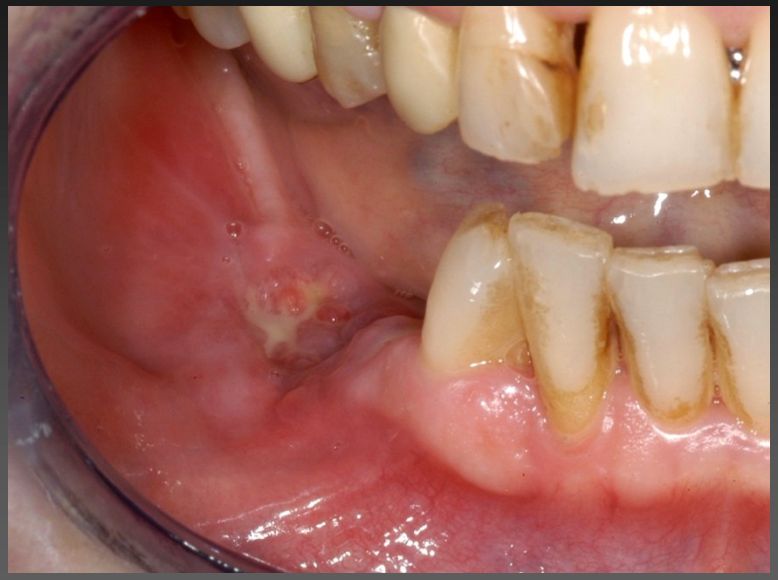


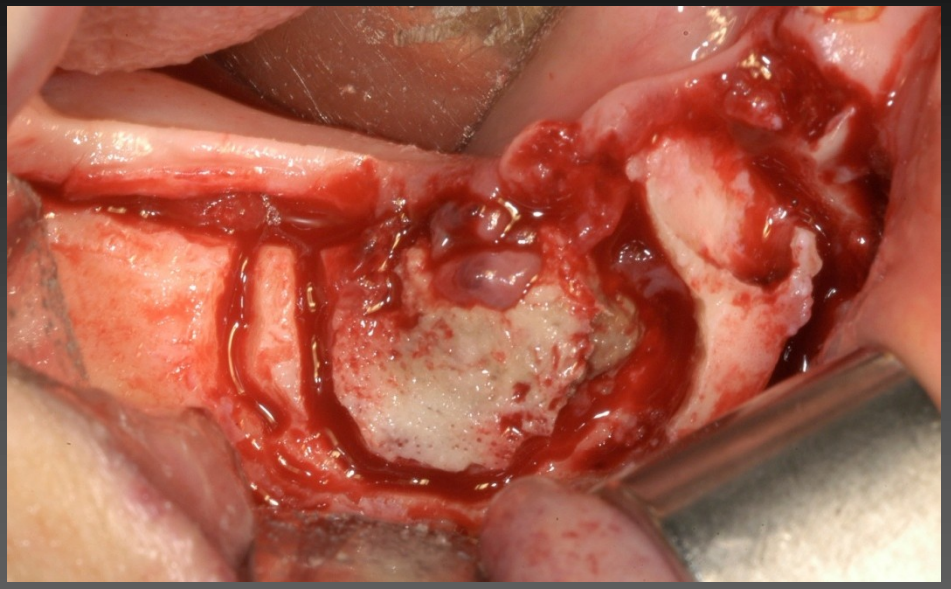


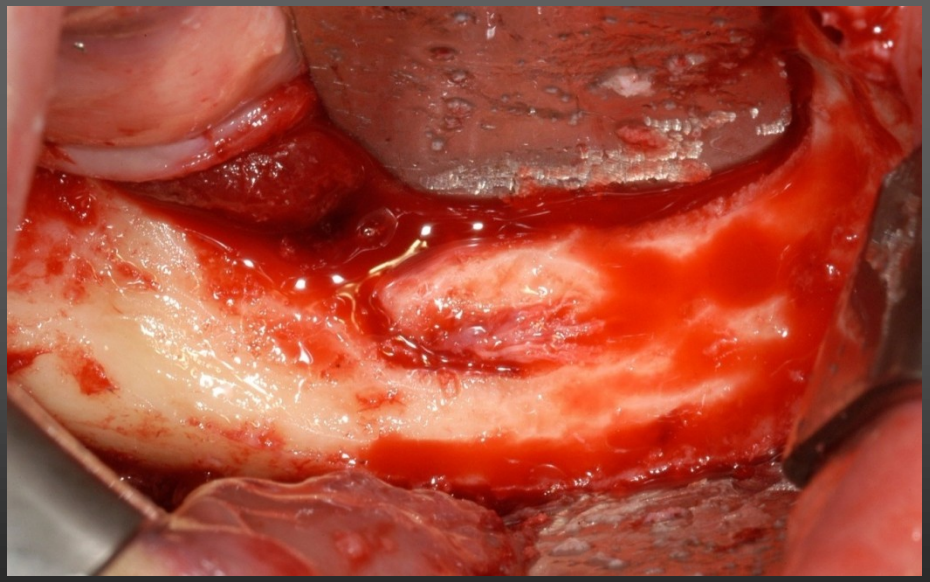


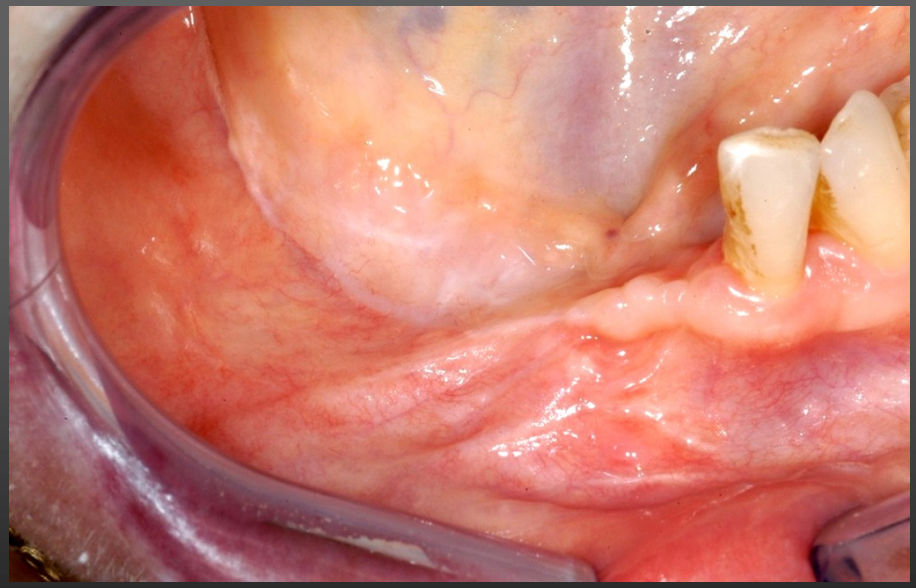
Controllo: 18 mesi



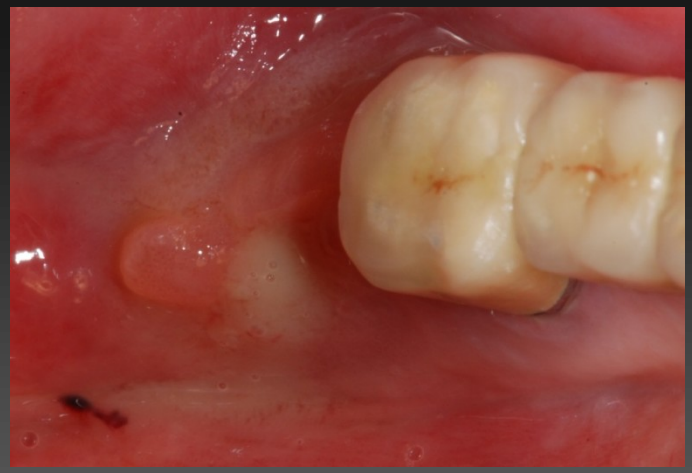


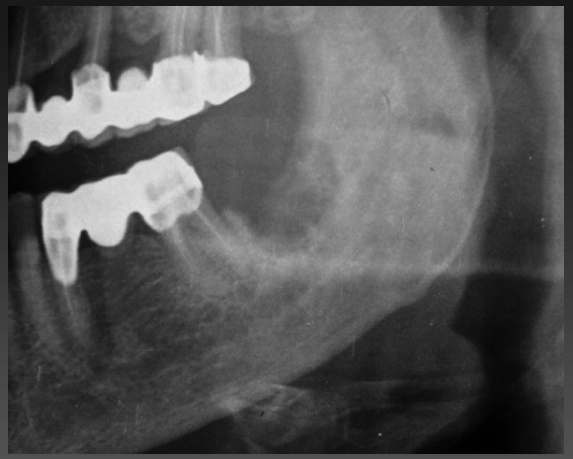


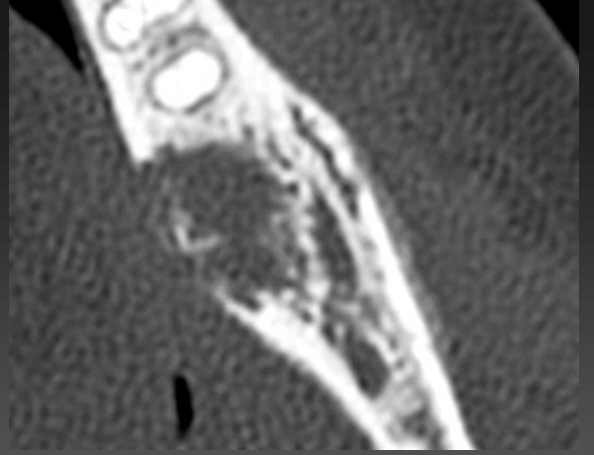


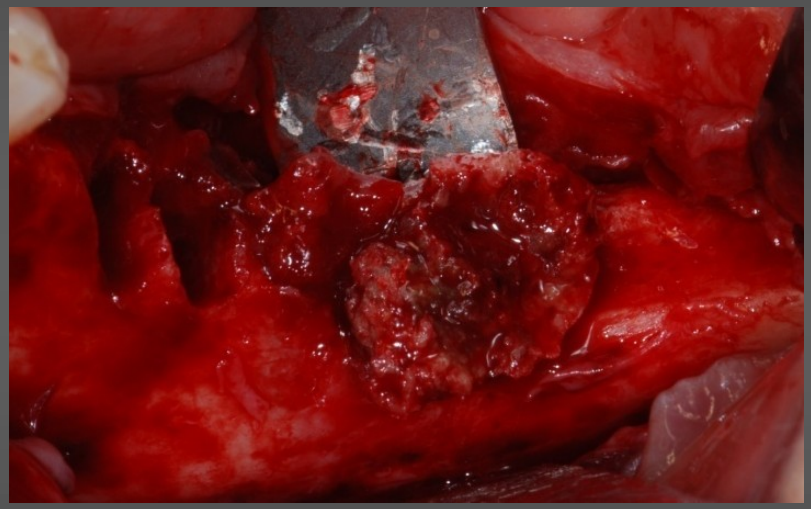


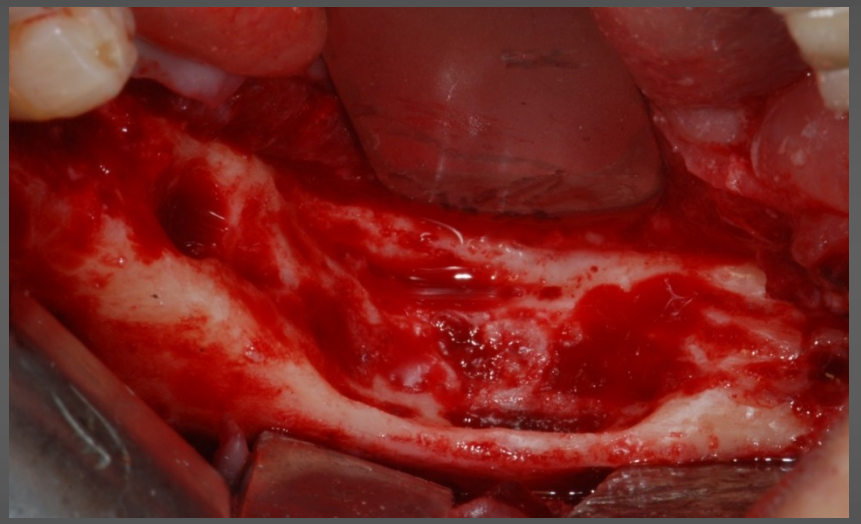
Controllo: 12 <u>mesi</u>

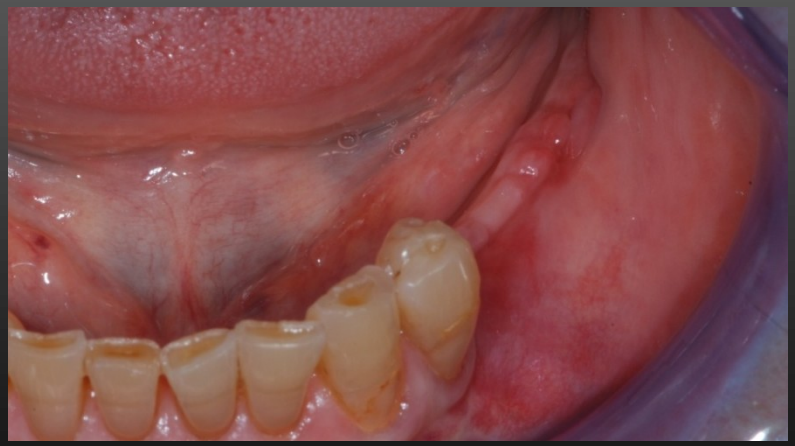












Controllo: *8* ***<u>mesi</u>***

risultati

casi operati	21
remissione della patologia	20
persistenza patologia	1
modesta esposizione ossea recuperata	2
riabilitati protesicamente	10
follow up	da 1 a 66 mesi
media 25 mesi	
pazienti attualmente in vita	11
pazienti deceduti	10

Conclusioni

Nessun incidente o decesso per problemi anestesiologici
Tempo medio di degenza …….. 6 giorni
Tempo di scomparsa del dolore ……3-10 giorni dall'intervento
Tempo di ripresa funzionale …….. 20-25 giorni
Tempo di protesizzazione …….. 60 gg (10 pti)
Periodo m. di sopravvivenza complessiva 25 mesi
Periodo m. di sopravvivenza deceduti…… 18 mesi
Follow-up medio pazienti in vita …… 32,4 mesi
Estremi di fallow-up …… 1 - 66 mesi