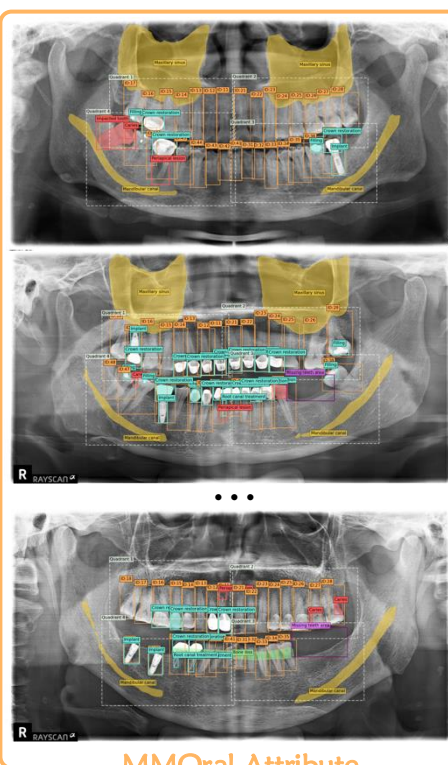




MMOral

- 4 sub-datasets
- 20k images
- 10 visual expert models
- 49 categories
- 904k bounding boxes
- 41k textual reports
- 965k QA pairs
- 296k conversations
- 5 dimensional analysis
- 60+ benchmarked VLMs



MMOral-Attribute

Location Caption

This localization caption provides multi-dimensional spatial analysis of anatomical structures and pathological findings for this panoramic dental X-ray image, including:

Teeth visibility with center points (total: 30):

```
{ 'point_2d': [1234, 806], 'tooth_id': '41', 'score': 0.93 },  
{ 'point_2d': [1500, 818], 'tooth_id': '34', 'score': 0.92 },  
{ 'point_2d': [1028, 828], 'tooth_id': '44', 'score': 0.91 },  
...
```

Wisdom teeth detection (total: 2):

```
{ 'box_2d': [1749, 414, 1896, 612], 'tooth_id': '28', 'is_impacted': false, 'score': 0.89 },  
{ 'box_2d': [504, 570, 690, 716], 'tooth_id': '48', 'is_impacted': true, 'score': 0.85 }
```

Dental caries detection (total: 1):

```
{ 'box_2d': [637, 615, 693, 669], 'tooth_id': '48', 'label': 'Caries', 'score': 0.45 }
```

Periapical lesion detection (total: 1):

```
{ 'box_2d': [781, 797, 875, 923], 'tooth_id': '46', 'label': 'Periapical lesions (Cyst)', 'score': 0.72 }
```

Historical treatments (total: 6):

```
{ 'box_2d': [786, 667, 917, 770], 'tooth_id': '46', 'label': 'Crown', 'score': 0.69 },  
{ 'box_2d': [1750, 730, 1821, 871], 'tooth_id': '37', 'label': 'Implant', 'score': 0.74 }
```

Mandibular canal visibility (total: 2):

```
{ 'box_2d': [1690, 517, 2143, 989], 'label': 'Mandibular canal', 'score': 0.89 },  
{ 'box_2d': [326, 521, 928, 987], 'label': 'Mandibular canal', 'score': 0.94 }
```

Maxillary sinuses visibility (total: 2):

```
{ 'box_2d': [605, 34, 1088, 490], 'label': 'Maxillary sinus', 'score': 0.89 },  
{ 'box_2d': [1388, 35, 1868, 509], 'label': 'Maxillary sinus', 'score': 0.95 }
```

Medical Report

This is a panoramic dental X-ray image, which provides a broad view of the entire mouth, including the teeth, jawbones, sinuses, and other structures. Below is a detailed analysis of the image:

Teeth-Specific Observations

1. General Condition:

- 30 teeth visualized with findings suggestive of clear anatomical definition.
- 2 wisdom teeth detected:
 - #28: Erupted (sign of wisdom tooth presence).
 - #48: Impacted (sign of impacted wisdom tooth).

2. Pathological Findings:

- #48: Suspicious for caries (recommend clinical re-evaluation).
- #46: Suspicious for periapical cyst (suggest further diagnostic evaluation).

3. Historical Interventions:

- #46: Sign of crown restoration.
- #36: Sign of filling.
- #16: Sign of crown restoration.
- #17: Sign of filling.
- #37: Sign of crown restoration and implant placement.

Jaw-Specific Observations

1. Bone Architecture:

- No apparent bone loss observed in the image.

2. Visible Structures:

- Imaging features signs of bilateral mandibular canals.
- Maxillary sinuses are visible bilaterally.

Clinical Summary & Recommendations

1. Priority Concerns:

- Periapical lesion at #46 requires further diagnostic evaluation and potential endodontic treatment.

- Suspicious caries at #48 should be clinically re-evaluated.

2. Preventive Measures:

- Fluoride application recommended for teeth with suspected caries.
- Oral hygiene instruction and plaque control measures should be emphasized.

3. Follow-up Protocol:

- 6-month recall for monitoring of suspicious caries and periapical lesion.
 - Bitewing series recommended for detailed assessment of interproximal areas.
- Further clinical correlation with physical examination and patient history is recommended for a comprehensive diagnosis.

MMOral-VQA

5 dimensional analysis (Teeth, Patho, HisT, Jaw, SumRec)

Condition of Teeth (Teeth)

Which tooth is impacted?

- A) #28
- B) #38
- C) #48
- D) #18

C) #48

Which teeth are identified as wisdom teeth and what are their statuses?

#28 is erupted and #48 is impacted.

Pathological Findings (Patho)

Within the specified region [781, 797, 875, 923], what disease is present?

- A) Periapical lesion on #46
- B) Dental caries on tooth #12
- C) Normal tooth on tooth #15
- D) Bone loss near tooth #46

A) Periapical lesion on #46

What pathological findings are associated with #46 and #48?

#46 is suspicious for a periapical cyst and #48 is suspicious for caries.

Historical Treatments (HisT)

What historical treatment is visible on tooth #46?

- A) Root canal treatment
- B) Dental implant
- C) Dental crown
- D) Dental filling

C) Dental crown

What types of historical interventions are observed in the teeth?

Crown restorations are observed in #46, #16, and #37. Fillings are observed in #36 and #17. An implant is also observed in #37.

Closed-Ended QA

Jawbone observations (Jaw)

What structure is present within the coordinates [326, 521, 928, 987]?

- A) Nerve pathway
- B) Maxillary sinus
- C) Mandibular canal
- D) Tooth

C) Mandibular canal

What is noted regarding the bone architecture in the radiograph?

No apparent bone loss is observed.

Open-Ended QA

Summary / Recommendation (SumRec)

What is recommended for the wisdom tooth #28?

- A) Extraction
- B) Filling
- C) Endodontic evaluation
- D) Crown

A) Extraction

What preventive measures are recommended?

Fluoride application and oral hygiene instruction with plaque control measures.

MMOral-Report

MMOral-Chat

Help me check if there are any issues in my panoramic dental X-ray image.



Let me walk you through the findings from your panoramic X-ray. We've identified a few areas that need attention. First, your wisdom tooth #48 is impacted, which means it's not erupting properly. Additionally, we've noticed a periapical lesion near tooth #46, which could indicate a cyst.

I'm not sure I understand what an impacted tooth is. Can you explain that?

Of course. An impacted tooth is like when a tooth doesn't have enough space to come in properly. Imagine trying to fit too many things in a small box; it gets stuck. In this case, tooth #48 is stuck and not coming in as it should.

Will this impacted tooth cause any problems? I'm worried about pain or needing surgery.

Right now, it's not causing any symptoms, but impacted teeth can sometimes lead to infections or crowd other teeth.