

# Comparison of Two Types Implant Supported Crowns in Anterior Section

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## Aim of study

Single tooth loss can be treated with conventional three-unit or adhesive bridges. The lost tooth can be also replaced with a dental implant. Prosthetically single tooth loss can be treated with a PFM (Porcelain Fused to Metal) crown or with an all-ceramic crown with a custom abutment from zirconoxide ceramics. They must be shaped and fabricated in harmony with esthetic rules and rules for implant supported crown loading. Even the compliance with these rules is done, complications can occur. The complications can be connected with improper technological procedure or incorrect articulation.

## Materials and methods

Implant supported single unit crowns in the anterior section of both jaws and their complications were compared from 2010 to 2014 on Department of Dentistry of Faculty of Medicine in Hradec Kralove.

Chipping and chipping off the ceramic layer to the metal coping (Fig. 1A, 1B) were considered as a complication for PFM crowns. Chipping, all-ceramic crown fracture, all-ceramic crown and also abutment fracture, bond failure between zirconiumoxide and titanium part of the abutment were evaluated for all-ceramic crowns. In a sample of 705 patients with 246 all-ceramic crowns and 614 with PFM, seven all-ceramic and 91 PFM crowns were not evaluated for non-cooperation of the patients. That's why the retrospective study included 681 patients with 239 all-ceramic crowns and 523 PFM crowns (Graph 1).

## Results

There were found complications as chipping as well as chipping off the ceramic layer to the metal coping for PFM in 2.1 % (11 in total). Graphs 2A and 2B show type of complication and its localisation for PFM crowns. Chipping, all-ceramic crown and abutment fracture as well as bond failure between zirconoxide and titanium part of the abutment were found in 2.0 % for all-ceramic crowns (5 in total). Graphs 3A and 3B show type of complication and its localisation for all-ceramic crowns. No single all-ceramic crown fracture was observed. Graph 4 shows the highest number of complications for PFM crowns within 4 years of the use. For all-ceramic crowns we noticed highest number of complications after 3 and 1 years (Graph 5). Graphs 6 and 7 show types of complication dependant on use time.

## Conclusions

Under limitation of this study, the chipping off the ceramic to the metal coping in PFM crowns was caused probably by the failure of the bond between both materials. The chipping was probably caused by disrespecting the patients' occlusal concepts. The fourth year of use was critical for PFM crowns. Failure of all-ceramic crowns was followed by abutment fracture, probably caused by overloading. To prevent all complication is necessary to follow all rules for these types crowns fabrication and the proper technology.

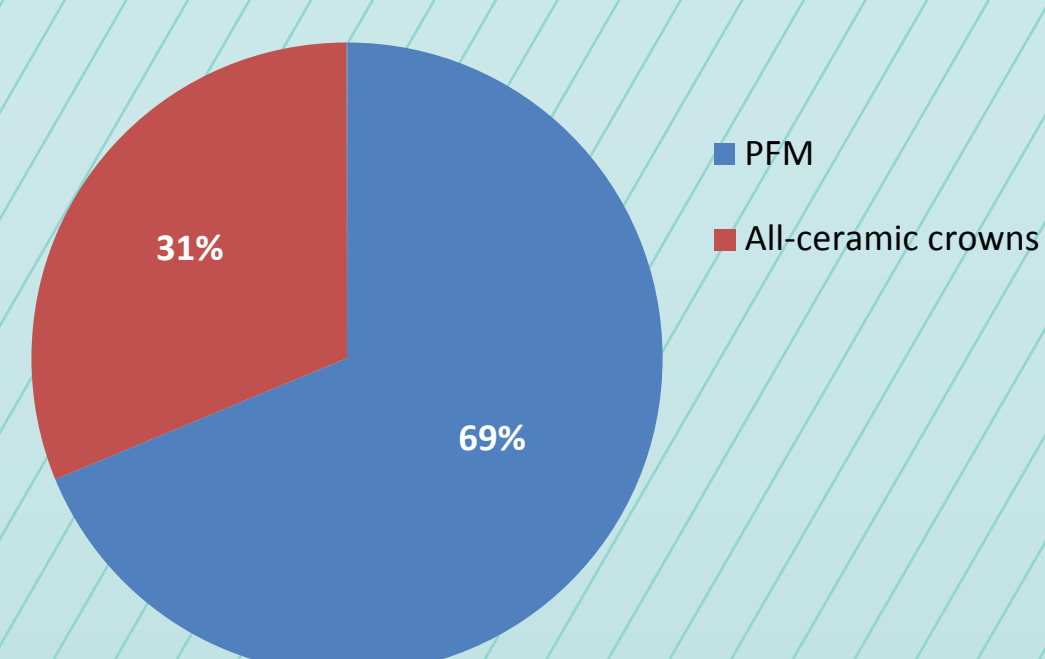
Supported by the programme PRVOUK P28.



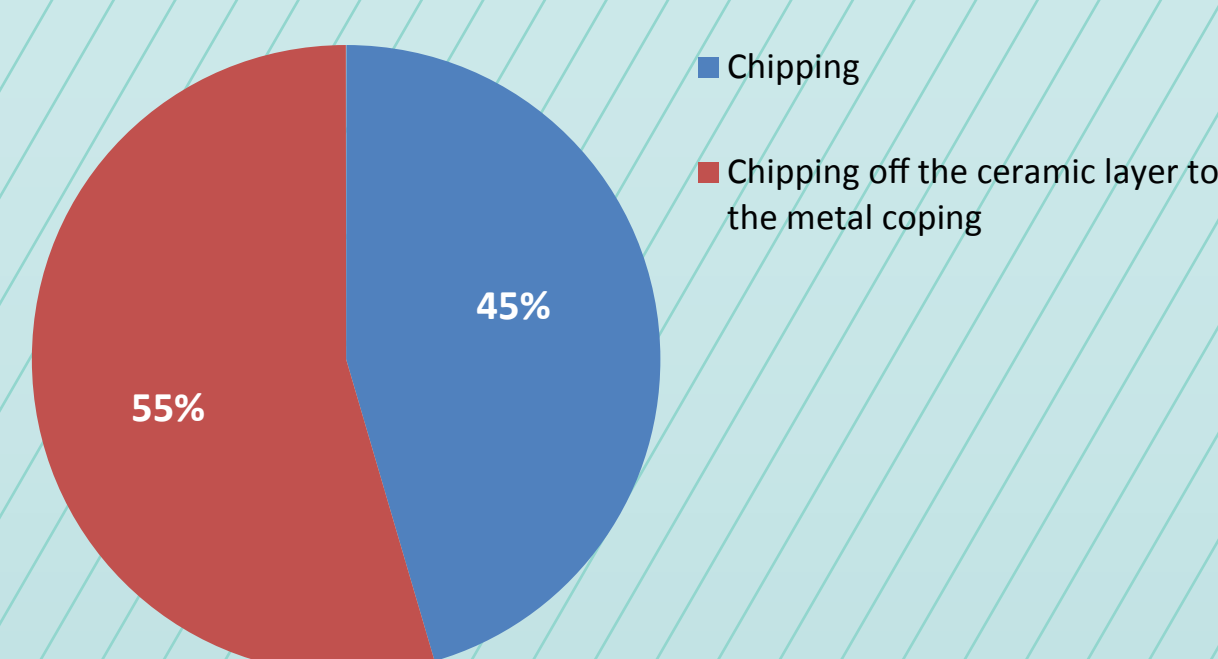
Figure 1A: Chipping off the ceramic layer to the metal coping in loco 012 buccal view.



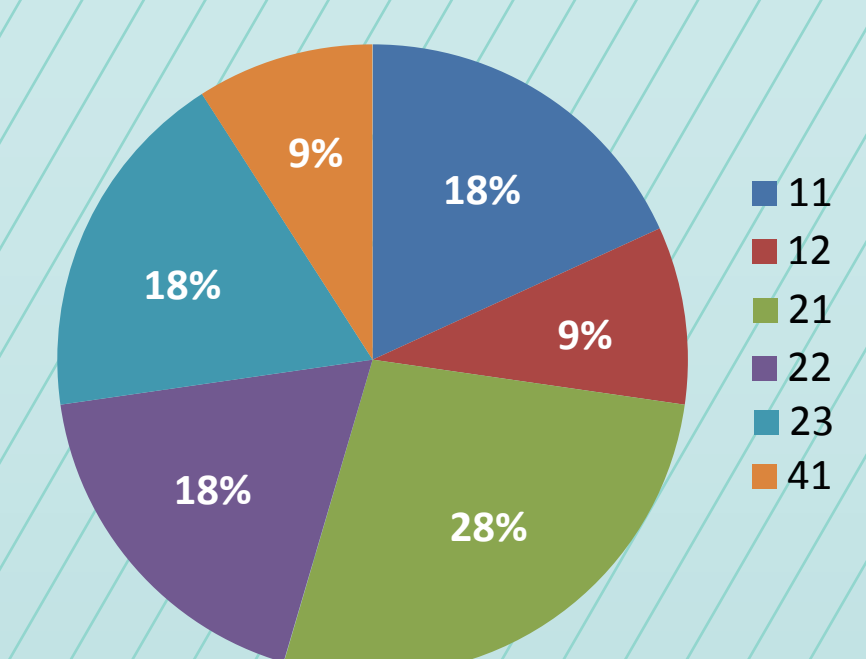
Figure 1B: Chipping off the ceramic layer to the metal coping in loco 012 oral view.



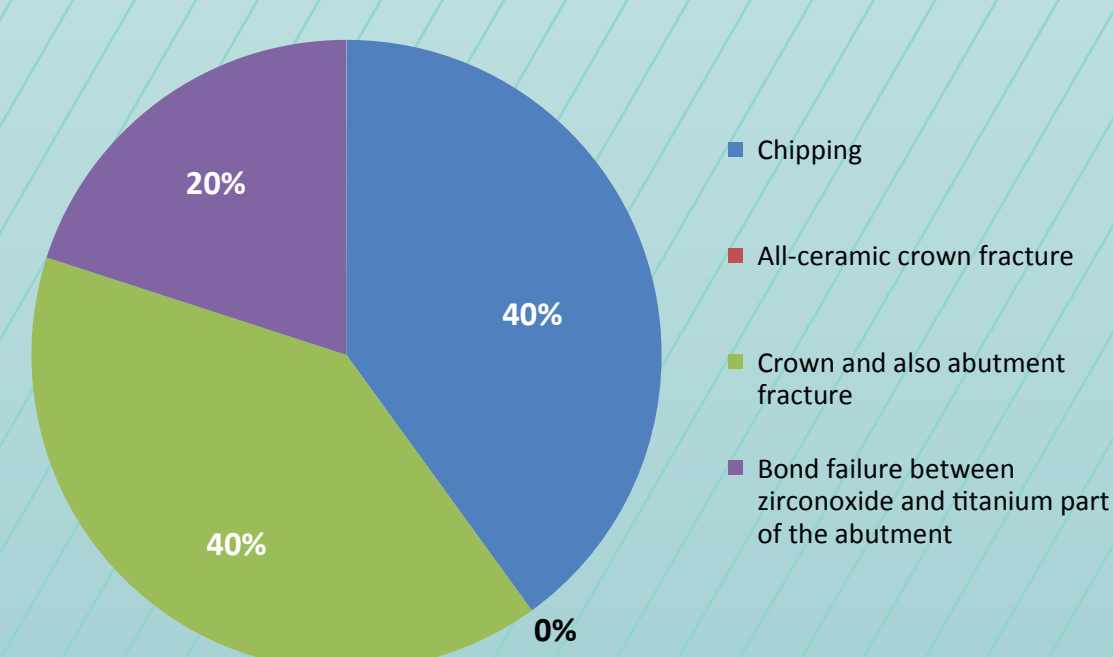
Graph 1: PFM and all-ceramic crowns fabricated in 2010-2014.



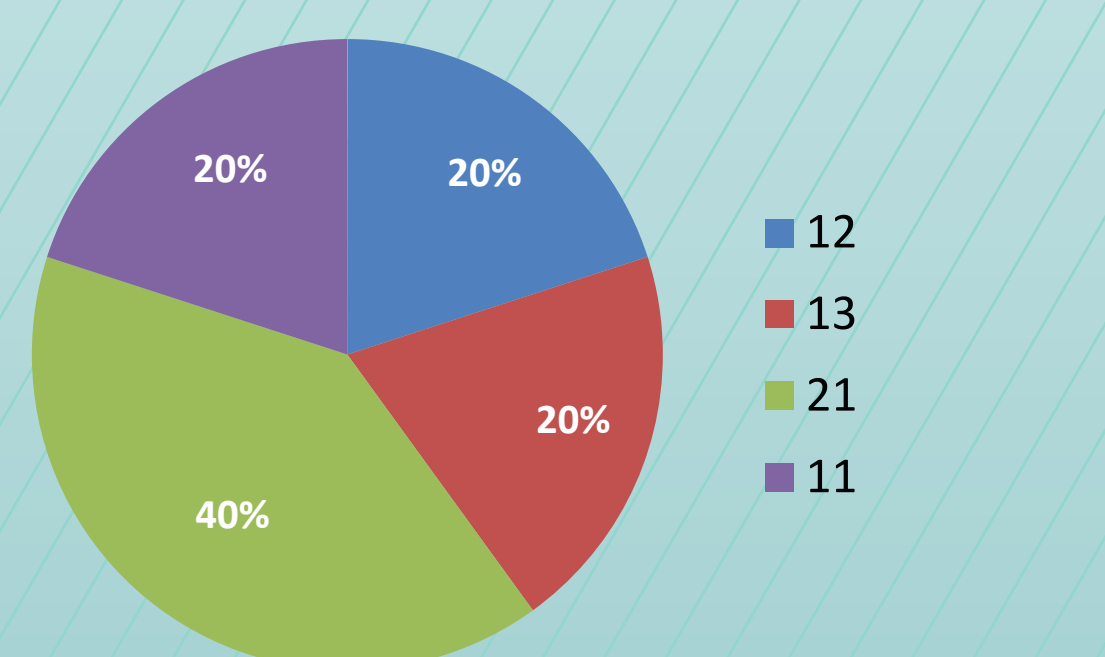
Graph 2A: Type of PFM complication.



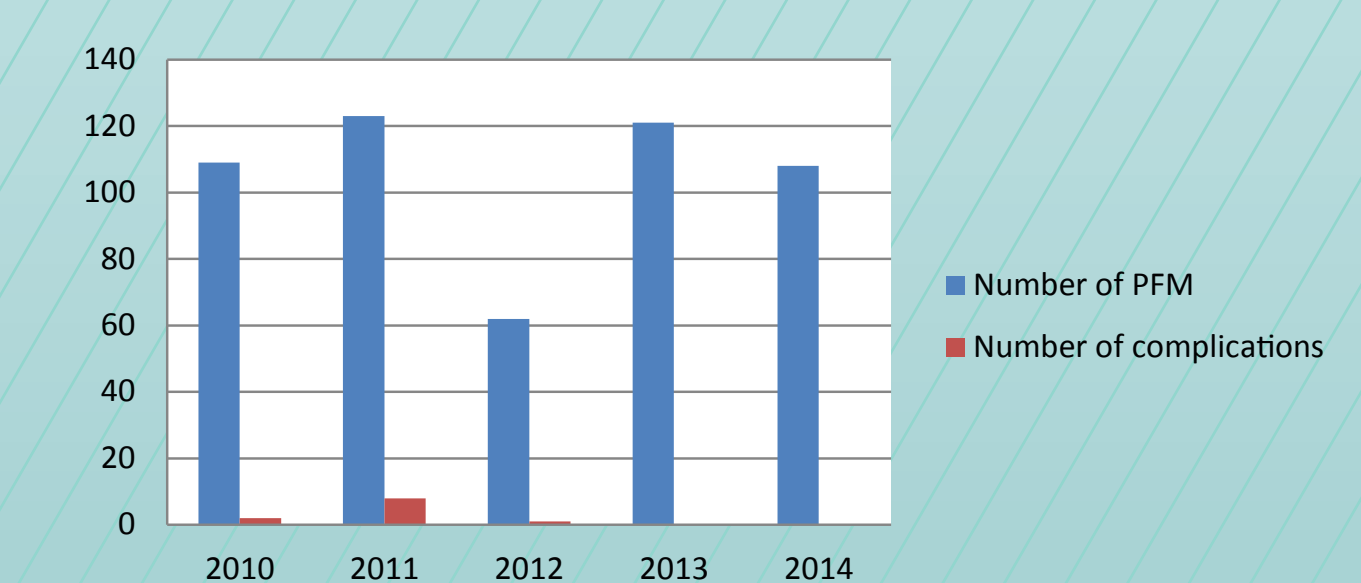
Graph 2B: Localisation of PFM complication.



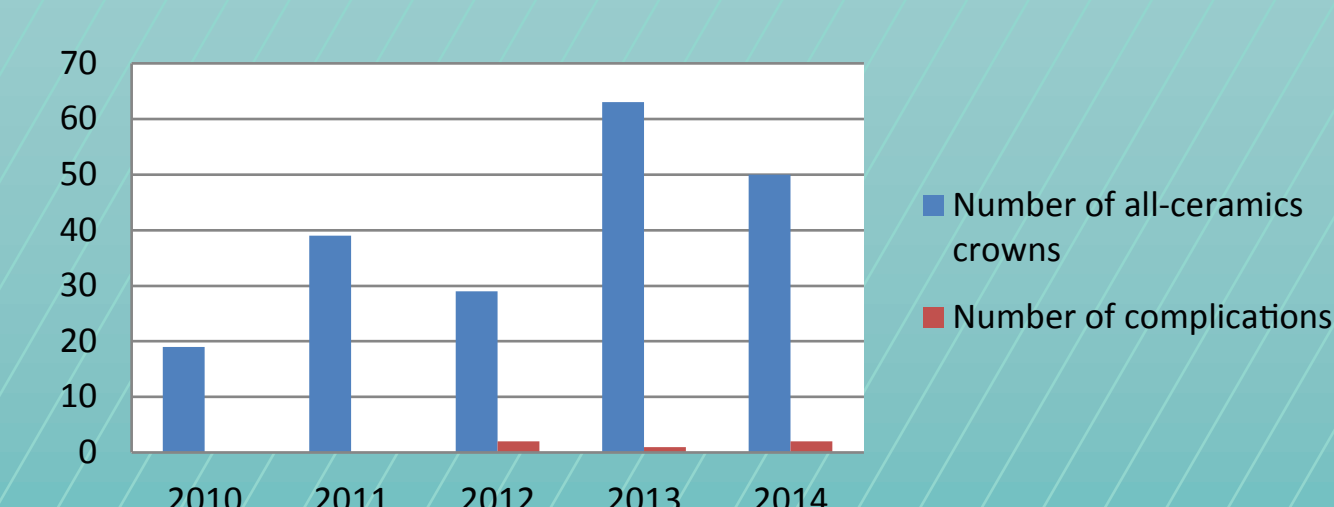
Graph 3A: Type of all-ceramic complication.



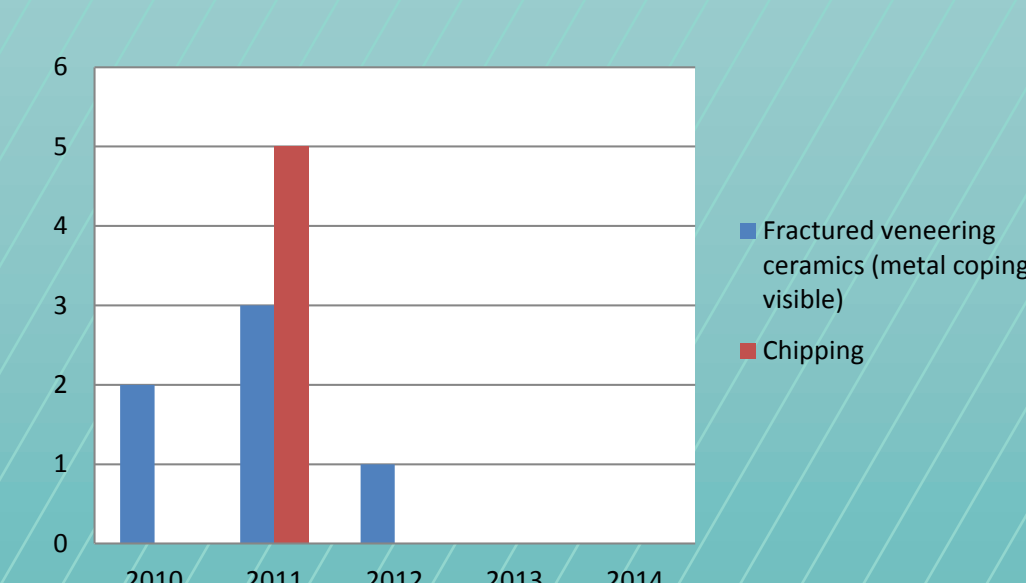
Graph 3B: Localisation of all-ceramic complication.



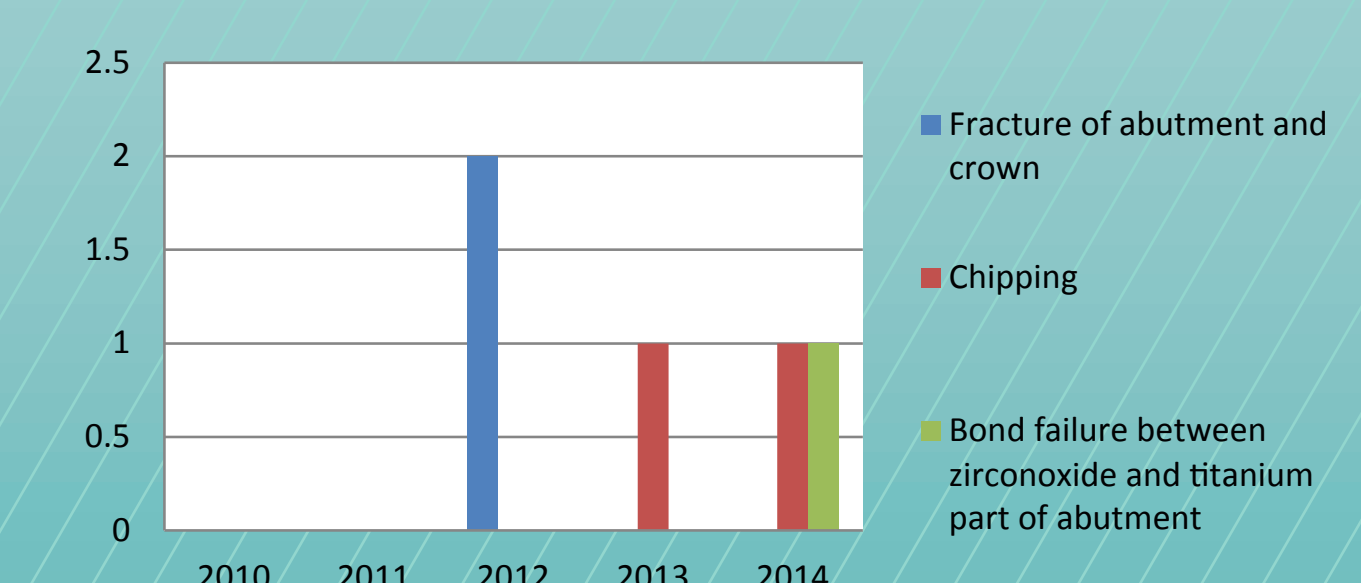
Graph 4: Number of PFM complications dependent on use time.



Graph 5: Number of all-ceramic crowns complications dependent on use time.



Graph 6: Type of PFM complications dependent on use time.



Graph 7: Type of all-ceramic crowns complications dependent on use time.