Risk of bias assessment according to ROB2 tool.

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| Study | Randomization process | Deviations from intended  | Missing outcome data | Measurement of the outcome | Selection of the reported result | Overall Bias |
| Uribe | Some concernsThe baseline differences between intervention and control groups suggest a problem with the randomization process asfemale ratio in groups was: 7: 10 and Irregularity index at T0 was 8.32: 6.73 | High riskNo mention of blinding of the patients and the operators.The authors did not do intention-to-treat (ITT) analyses and this may have substantial impact on the result. | High riskThe results can be biased by the missing data. Allocated patients were 19: 16, but the analyzed patients were16:13. | Low riskThe measurement method is appropriate | Low riskall reported results for the outcome domain correspond to all intended outcome measurements. | High riskhigh risk of bias in at least one domain |
| Tuncer | Low riskThe allocation sequence was random and adequately concealed. Also. There was no information about baseline imbalances | Some concernsBlinding of either the investigator or patients was not possible, and the deviations arise because of the experimental context.Also, the authors did not mention ITT analysis that can be used to estimate the effect of assignment to intervention. | Low riskOutcome data were available for all, or nearly all, randomized participants | High riskThe authors reported that all measurements were done in the patients’ mouth and for right and left sides separately. This method has poor validity. | Low riskall reported results for the outcome domain correspond to all intended outcome measurements. | High riskhigh risk of bias in at least one domain |
| Abbas | Some concernsThere is no information about allocation concealment. Also, there is no baseline characteristic for the intervention side and the control side.  | High riskThere is no information about the blinding of the patients and the operator, and it may be possible they know the intervention side and the control side. Also, there is no information regarding the deviations from intended interventions. | Low riskOutcome data were available for all, or nearly all, randomized participants | Some concernsAlthough the measurement method is appropriate, there is no information if the outcome assessors were aware of the intervention received (the scars) which may affect the outcome especially periodontal indexes. | Low riskall reported results for the outcome domain correspond to all intended outcome measurements. | High riskhigh risk of bias in at least one domain |
| Aksakali | Some concernsThere is no information regarding allocation concealment. | Some ConcernsThere was no blinding for the patients and the operator, with no information regarding deviations from the intended intervention. | Low riskOutcome data were available for all, or nearly all, randomized participants | Low riskThe measurement method is appropriate | Low riskall reported results for the outcome domain correspond to all intended outcome measurements. | Some Concernssome concerns in at least one domain |
| Alfawal | Low riskThe allocation sequence was random and adequately concealed. Also. There was no information about baseline imbalances | Some ConcernsThere is missing data in the both groups without ITT analysis. | Low riskOutcome data were available for all, or nearly all, randomized participants | Low riskThe measurement method is appropriate | Low riskall reported results for the outcome domain correspond to all intended outcome measurements. | Some concernssome concerns in at least one domain |
| Charavet 2016 | Some ConcernsThere is no information regarding the allocation concealment. Also, the difference in the age between groups suggests a problem in the randomization process. The mean age was 27 years in the control group vs 34 years in the piezocision group. | Some ConcernsThere was no blinding for the patients and the operator, with no information regarding deviations from the intended intervention. | Low riskOutcome data were available for all, or nearly all, randomized participants | High RiskDuring treatment, the change of the archwires is done by operator thus he recognizes the piezocision patients and this may affect the outcome. | Low riskall reported results for the outcome domain correspond to all intended outcome measurements. | Some Concernssome concerns in at least one domain |
| Charavet 2019 | Low riskThe allocation sequence was random and adequately concealed. Also. There was no information about baseline imbalances | Low riskPatients and operators were aware of intervention groups during the trial but there is no deviations from intended intervention arose because of the experimental context | Low riskOutcome data were available for all, or nearly all, randomized participants | Low riskThe measurement method is appropriate | Low riskall reported results for the outcome domain correspond to all intended outcome measurements. | Low risklow risk of bias for all domains |
| Charavet (PROMs) 2019 | Low riskThe allocation sequence was random and adequately concealed. Also. There was no information about baseline imbalances | Low riskPatients and operators were aware of intervention groups during the trial but there are no deviations from intended intervention arose because of the experimental context | Low riskOutcome data were available for all, or nearly all, randomized participants | High riskThere is a deference in the time points for groups, the control is assessed for 7 days after appliance bonding and the intervention group is assessed 7 days after bonding and also after additional week, with more visits for the intervention group. Also, the patients were assessor of the pain, and as they know the surgical procedure, this may create bias toward pain assessment. (the assessor is aware of the intervention) | Low riskall reported results for the outcome domain correspond to all intended outcome measurements. | High riskhigh risk of bias in at least one domain |
| Gibreal 2018 | Low riskThe allocation sequence was random and adequately concealed. Also. There was no information about baseline imbalances | Some ConcernsThere is missing data in the both groups without ITT analysis. | Low riskOutcome data were available for all, or nearly all, randomized participants | Low riskThe measurement method is appropriate | High riskThe authors have two different outcomes (one for decrowding and one for the duration of alignment)They reported the decrwoding take more than two months to be resolved in piezocision group. In contrast they reported that the alignment has done by less than two months in piezocision group. | Some Concernssome concerns in at least one domain |
| Gibreal 2019 | Low riskThe allocation sequence was random and adequately concealed. Also. There was no information about baseline imbalances | Some ConcernsThere is missing data in the both groups without ITT analysis. | Low riskOutcome data were available for all, or nearly all, randomized participants | High riskThere is a deference in the time points for groups. The time point for recording the outcome is not clear for the two groups, as this point was at specific days following the onset of treatment, but there is no clear relation with the intervention and this mean measurement differences between groups.  | Low riskall reported results for the outcome domain correspond to all intended outcome measurements. | High riskhigh risk of bias in at least one domain |
| Al-Imam 2019 | Low riskThe allocation sequence was random and adequately concealed. Also. There was no information about baseline imbalances | Some ConcernsBlinding of either the investigator or patients was not possible, and the deviations arise because of the experimental context. | Low riskOutcome data were available for all, or nearly all, randomized participants | Low riskThe measurement method is appropriate | Low riskall reported results for the outcome domain correspond to all intended outcome measurements. | Some Concernssome concerns in at least one domain |
| Raj 2020 | Some Concerns There is no information regarding allocation concealment | High riskThere is missing data in the both groups without ITT analysis, and also the excluded data may have impact on the results (more than 20%) | Some Concerns The availability of data from 95% of the participants would often be sufficient. In this study the availability of data is 80% but the result was not biased by missing outcome data (split mouth design). | High riskThe method of measuring is not appropriate (canine retraction rate was measured by the distance between the mesial aspect of the molar tube slot and the distal aspect of the canine bracket, measured intraorally)The method of measurement is not valid  | Low riskall reported results for the outcome domain correspond to all intended outcome measurements. | High riskhigh risk of bias in at least onedomain |