Informed consent form · Informed notification page

Dear patient:

You are diagnosed as malocclusion by your doctor. You are invited to participate in a clinical study “The efficacy of TADs assisted Herbst appliance for Angle Class II division 1 hyperdivergent patients with early permanent dentition”. The project is funded by Shanghai Commission of Science and Technology (20Y11904100, 20YF1442400), Shanghai Municipal Health commission (20224Y0391) and the Clinical Innovation Team of Shanghai Stomatological Hospital (SSDC-2020-CXTD-A04). This study protocol has been reviewed by the Medical Ethics Committee of Shanghai Stomatological Hospital.

Before you decide whether to participate in this study, please read the following carefully. It can help you understand the aim, procedure and duration of the study, and the benefit, risk and discomfort you may have. If you wish, you can also discuss with your relatives and friends, or ask a doctor to explain it to help you make a decision.

1. Why we conduct this study?
   1.1 Disease burden and the current status of the treatment

Class II malocclusion is a common maxillofacial deformity, characterized with mandibular retrognathism as the main feature in the Chinese population. Functional appliances have been introduced to children who are in the growth and development stage. Among them, the representative Herbst appliance was first proposed by German scholar Herbst at the International Dental Conference in Berlin in 1909. Herbst appliance is a fixed occlusal forward device. The Herbst appliance, is a fixed forward occlusal device that keeps the mandible in the forward extension position and stimulates the growth of the condyle and mandible.

Compared to other functional appliances, Herbst appliance can result in intrusion of
upper molars, which contributes to a clockwise rotation of the occlusal plane. If this is not controlled vertically, it may result in an increase in skeletal divergence, which is not conducive to the treatment of angle II high angle patients. Since the close relationship between occlusal plane and the mandible position, the key for orthodontic treatment is to maintain or even decrease the inclination of occlusal plane, achieving the counterclockwise rotation of the mandible and a promising profile.

1.2 The purpose of this study
The purpose of this study is to compare the clinical effects of Herbst treatment with or without vertical control in terms of dental and maxillofacial development, mandible position and profile attractiveness in children who were diagnosed with hyperdivergent skeletal Class II malocclusion.

1.3 Study participants and the number of expected participants
The study will be conducted in Shanghai Stomatological Hospital. According to our previous pilot study, the mean OP-SN angle decreased by 2.5±2.8 in adolescents who were treated with innovative Herbst appliance with vertical control, while the average change of OP-SN angle in the standard Herbst group was 0±2.8 degrees. 18 participants in each group can provide 95% power to detect a minimum clinically significant difference in the OP-SN of 0.7 degrees (using α=0.05). The sample size calculation was based on a two-sided hypothesis. Considering an anticipated 20% dropout rate, the final sample size is a total of 44, and 22 participants in each group.

2. Who were invited to join the study?
1) Patients aged from 10 to 13 years old who are at or right before the peak of the pubertal spurt assessed using vertebral analysis
2) Class II, division 1 malocclusion characterized by mandibular retrognathism and normal or mild maxillary protrusion (A point, Nasion, B point [ANB] ≥ 4)
3) Minimum overjet of 4 mm in permanent dentition
4) Hyperdivergent growth pattern (FMA>33)
5) Good oral health condition (healthy periodontal tissue, no periapical disease and no unfilled caries)
3. How was the study conducted?

We will enroll 44 children aged from 10 to 13 years who are diagnosed with angle Class II malocclusion. The participants will undergo a series of medical tests, including physical examinations and maxillofacial radiography, to verify the diagnosis. Once enrolled in the study, subjects will be randomly divided into one of two treatment groups - the Herbst group, or the Herbst with vertical control group - at a ratio of 1:1. The enrolled subjects will undergo Herbst treatment or Herbst treatment with vertical control within 4 weeks after randomization. Both treatment methods will be implemented by experienced doctors.

Subjects receiving Herbst treatment will be fitted with a standard Herbst appliance for 10 months. Routine follow-up will be conducted every 4 weeks until the end of the treatment. Subjects receiving Herbst with vertical control treatment will be fitted with a Herbst appliance accompanied by miniscrew implants for occlusal plane leveling. Miniscrew implants will be inserted 1 week after the Herbst appliance is settled. Patients will be given appointments at 4-week intervals. The patients and their guardians will be well informed by the doctor for the study content, and sign the informed consent after full consideration. Three study visits per subject will be scheduled in the study as follows: baseline assessment visit (T0), initiation of Herbst therapy visit (T1), and end of Herbst therapy visit (T2). At scheduled visits, data relating to lateral cephalometric radiographs, CBCT scanning, subjective assessment of VAS, adverse events will be recorded and collected.

4. The possible impact of participating in the study on the subjects’ daily life

When you decide whether to participate in this study, please carefully consider the possible impact of the examination and follow-ups as listed above on your daily life, etc. Consider the time schedule for each visit and the traffic. If you have any questions about the examinations and steps involved in the test, you can consult with us. Considering your safety and to ensure the validity of the study results, you cannot participate in any other clinical studies on drugs and medical devices during the study.
5. Possible adverse effects, risks and discomfort, and inconvenience of participating in the study

The discomfort you may undergo after the placement of the Herbst appliance, including the discomfort in tongue, mucosa and temporomandibular joint area. Mini-implants insertion may cause the risk of implant breaking, loosening, and soft tissue local inflammation. The oral appliance may affect the appearance, causing inconvenience during speech and eating.

6. Potential benefits of participating in the study

Although Studies have proven the satisfactory outcome of Herbst appliance in skeletal Class II treatment, this does not guarantee the treatment outcome for you. The protocol used in this study is not the only way to treat mandibular retrognathism. If the Herbst appliance is not beneficial to your condition, you can ask for alternative treatment methods. The examination fee will be covered in this study. All the patients will get the free orthodontic planning for second stage treatment.

7. Confidentiality of personal information

Your medical records (study records / CRFs, laboratory sheets, etc.) will be kept in the hospital where you visit. Your doctor will record the results of the laboratory tests and other tests on your medical record. The investigator and the ethics committee will be allowed to access to your medical records. No public report on the results of this study will disclose your personal identity. We will make every effort to protect the privacy of your personal medical information as permitted by law.

According to medical research ethics, in addition to personal privacy information, trial data will be available for public inquiry and sharing, and it will be limited to electronic databases, ensuring that no personal privacy information will be leaked.

8. Related expenses

The examination fee is RMB 400 yuan, and the subsequent phase II treatment plan is free. You need to pay for the Herbst appliance, mini-implants and orthodontic treatment.

When your health condition is compromised by participating in this study, please inform the investigator, and we will immediately take the necessary medical methods...
to protect your health. According to the relevant laws and regulations of China, the sponsor of this study will cover the corresponding medical expenses and the corresponding economic compensation in the event of any injury related to the study.

9. Do you have to attend and complete this study?

You may choose not to participate in this study, which will not have any adverse effect on your standard medical care. You will not suffer any discrimination accordingly. Even if you consent to participate, you may withdraw from the study at any time without any reason, and this will not affect your access to standard medical services. When you decide not to participate in this study, you need to inform your study doctor that the study doctor can provide advice and guidance on your health status.

We will inform you of any information that may affect your decision to continue your participation in this study.

In case of gingival recession, dental disease or systemic disease during the treatment, the treatment should be stopped in time and transferred to relevant departments for treatment to ensure the safety and rights and interests of patients.

In the event of an early termination of this study, or for your best interest, your doctor may suspend you during the course of the study. Your doctor will advise you on your next treatment plan based on your health status.

Other information required to inform the subject:

For dropout subjects, we have a final follow-up plan and you have the right to refuse. If any unused study drug or device should be returned to your doctor. If you withdraw and find new information about your health and rights, we may contact you again.

After the withdraw, it should be clear that no new data will be collected. Participants will also be given detailed instructions on how to handle previously collected study data and withdrawal data due to adverse events.

If you withdraw from the study for any reason, you may also be required to have a laboratory examination and a physical examination if your doctor thinks it is necessary.

10. What should I do now?
Whether or not to participate in this study is up to you (and your family members). Ask your doctor for questions before making your decision to participate in the study. Please call (office number with area code during working hours), after work hours, weekends and holidays (24 hours landline or mobile phone with area code). The supervision number for hospital ethical committee is 021-54668034. Thank you for reading. If you decide to participate in this study, please tell your doctor that he/she will arrange for you about the study. Please keep this information.
Informed consent. Signature page

The researcher's statement

I have informed the subject and the subject's guardian about the background, purpose, steps, risks and benefits regarding to the study “The efficacy of TADs assisted Herbst appliance for Angle Class II division I hyperdivergent patient with early permanent dentition”.

The subject and his/her guardians had enough time to read the informed consent form and discuss it with others. I have answered all the questions about the research. I have informed the subject that he/she can access to Dr. Jie Pan with any related questions about the study. He/she can reach the hospital medical Ethics Committee when encountering problems related to your own rights/interests. I have provided the accurate contact information. I have informed the subject that he/she may withdraw from the study without any reason. I have informed the subject that he/she will have a copy of this informed consent form. It contains me and his/her signatures. I confirm that the patient has been explained all the details of this trial, including his/her authority and possible benefits and risks, and given a copy of the signed informed consent form.

Doctor's signature: ____________________  Date: ________________

The Doctor's work phone number: ____________________
Subject statement

My child and I have been fully informed of the background, purpose, steps, risks and benefits regarding to the study “The efficacy of TADs assisted Herbst appliance for Angle Class II division 1 hyperdivergent patient with early permanent dentition”.

I had plenty of time and opportunities to ask questions. I was pleased with the answers. I was also told who I should contact when I had problems, difficulties, concerns. I have read this informed consent form, and I have agreed to participate in this study. I know that at any time during the study I can have my child withdraw from the study without any reason. Furthermore, I have discussed this research project with my child, and my child agreed to participate in this study, knowing that without any reason at any time during the study I could request him/her to withdraw from the study. I was informed that I would have a copy of this informed consent form containing the signatures of me and the investigator.

Subject guardian signature: ________________ Date: ________________

Contact number: ________________