Study on Experimental Teaching Method of Cavity Preparation of Caries

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Abstract: Cavity preparation is an important part of caries teaching. And it is very important to cultivate students' basic clinical ability. This paper analyzes the existing problems in the experimental teaching of hole preparation, and proposes to reform the teaching mode and teaching methods, so as to lay a good foundation for students to truly master the basic clinical skills of hole preparation.

1. Introduction

Dental caries is a major component of endodontic. Cavity preparation is an important content in caries experimental teaching, which is of great significance in consolidating theoretical knowledge and cultivating students' basic operation ability in preclinical period. The characteristics of the anatomical and physiological structure of teeth, the plain preparation points and the boring cavity structure leave a clear and solid impression in the minds of students, which are the unremitting pursuit of dental endodontic teachers. In order to improve the teaching effect, this paper puts forward a teaching method which is easier for students to understand, grasp and apply.

2. Existing problems in traditional experimental teaching

2.1 Single experimental teaching methods

Generally, lecture-based learning (LBL) mode is adopted, which is characterized by large amount of information to be taught, fast progress, complete structure and strong systematicness [1]. However, due to the fact that it is an injection-based teaching, which is mainly based on verification experiments, and is explained and taught by teachers and imitated by students, this method is simple and boring, difficult to digest and understand the abstract concepts, not conducive to students' understanding and memory of the learning content, and disjointed from clinical practice. It is shown in Fig.1. For example, even though the experimental teachers have repeatedly emphasized the characteristics, preparation methods, steps, principles and points of various types of holes, it is difficult for students to accurately understand the difference between holes and shapes and the basic concepts of holes after theoretical learning. This model can systematically and comprehensively explain the complete theoretical system of dental caries, fully reflecting the systematicness and foundational nature of the discipline. In the classroom, knowledge points are mostly input. The classroom atmosphere is dull, students' learning participation and initiative decline, and the cultivation of students' ability to analyze and solve problems is out of the question.

2.2 Some contents of the experiment are outdated and do not conform to the new development of stomatology

For example, in modern dental prosthodontics, amalgam fillings have been widely replaced by powerful bonding prosthodontics technologies. The improvement of the performance of new resin materials and the update of self-etching adhesive materials have expanded the requirements for the

preparation of cavity, and the requirements for cavity are relatively simplified. It puts forward new requirements for modern stomatology students, from the complex cavity preparation in the past to the application of bonding technology, the treatment of bonding surface and so on.

2.3 Inadequate clinical operation training

Set in the existing experimental teaching although comprehensively the basic operation training, but limited by experiment time, students of all operating practice only mechanical imitation again, cannot achieve or mastering a skill requirements, part of the beginning ability is relatively weaker students may have a negative impact, and even in clinical practice with fear, have no confidence. Internship base conditions are poor. Students in the internship operation time is insufficient, some students into clinical practice or even after graduation clinical operation ability is poor, unable to quickly competent work. In order to improve the students' ability of clinical operation, analysis and problem solving under the current practice conditions, it is necessary to put more effort and effort into experimental teaching.

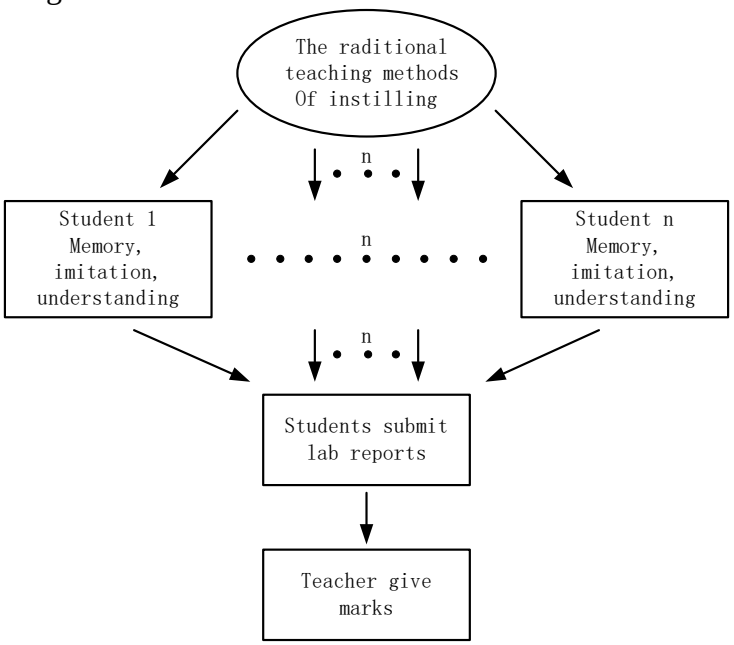

Fig. 1 Two or more references

3. Some ideas on teaching methods of caries cavity preparation

A multidimensional experimental teaching method for the preparation of caries cavity was designed. It is compared with the backward experimental teaching methods as figure 2.

3.1 The application of pluralistic way of teaching and learning

Information technology brought a lot of convenience to teaching, a large number of network curriculum and network resources, will help the ordinary institutions of higher learning in the daily teaching arrangement, and can increase the 3 d animation simulation and online interactive, provides the human-computer interaction function to achieve "one to one" interactive teaching of computer to students, to simulate the whole experiment process, let the students watch the work could not see, can't see the cavities of preparation principle, amalgam filling each steps and details, so as to promote students' understanding of learning and memory; The use of computer multimedia teaching, can effectively make up for the shortcomings of traditional teaching, abstract into concrete [4], difficult to understand the content or not easily observed, such as the treatment of dental decay principle and process of cavity filling with animation, video display fully, to arouse the students' intuitive visual function, create good atmosphere for breakthrough teaching difficulty, to optimize

the structure, improve teaching efficiency in classroom teaching effect, stimulate students' creative thinking.

3.2 Application of PBL teaching mode

As a new teaching mode, Problem Based Learning (PBL) requires both teachers and students to change their ideas [2]. Teachers from the former indoctrination of knowledge "crammers" to become a listener; At the same time, students should change from passive knowledge "fill in" to active knowledge acquisition. More scholars proposed that PBL combined with CBL (case-based learning) in caries teaching can better improve students' ability to analyze and solve clinical problems [3]. Improvement method: (1) In order to better carry out PBL teaching, teachers should be more fully prepared for the content of the experimental course, put forward problems for the difficult points of teaching, and to foresee the students may have questions. For example, the difference between the concept of hole shape and hole shape, the difference points of various types of hole shape and so on. (2) Choose some gypsum dental model and in vitro teeth, with the method of PBL review the advantages and disadvantages of preparation, analysis of the reasons for failure and solutions.

3.3 Cognition practice and thinking model construction

How to make students who have never been in contact with clinical cases truly understand the characteristics of the holes and the key points of their preparation is a difficult point in teaching, and also the most important. Therefore, the preclinical cognition practice process is a good combination of oral medicine students' theory and practice. After the theoretical study and before the experimental class, the theoretical knowledge of cavities can be understood by directly observing the preparation process of the cavity in the patient's mouth. Even through the slide show and video data, most beginners still have difficulty in understanding the effect of the box-shaped hole with straight bottom, straight wall, dot, line, Angle and blunt circle. After many internship and teaching summaries, we try to help students to construct a three-dimensional thinking mode to understand the holes. For example, after students clearly draw the trajectory of the hole shape on the plaster tooth, they should not simply answer students' doubts, but help students to apply the concepts in solid geometry. The vertical distance from a point to another plane is its projection, which is easy to determine whether the ground is flat or the wall is straight. Starting from the most simple cavity preparation, the three-dimensional spatial thinking mode is used to learn the dentistry of dental pulp, which is more conducive to the later practice of cavity preparation in the mouth, root canal treatment and other operations.

3.4 Improving experimental teaching methods

(1) Strengthening graphic teaching and improving the quality of graphic teaching. Classroom is a selection of images well chosen should not be more, want to select graphics clear and structure of typical images in detail, and the auxiliary AIDS in dental model, and in the process of teaching, figure by giving students speak, lead the students on gypsum teeth and teeth in vitro map-reading, mapping, through clinical cases pictures finally realize test figure, let students really understand the characteristics and the key points of preparation of all kinds of hole shape. (2) Practical operation in imitation of the head model, this can maximize the simulation of clinical operation, shorten the distance between experimental class and clinical, so the quality of practical operation skills directly affect the teaching quality and medical quality. (3) In addition to the use of conventional validation experiments, the use of design experiments. Such experiments are heuristic and should be carried out in small groups. For example, for the preparation of cavity shape, the detached tooth with caries was installed on the imitation head mold. Students designed the experimental scheme according to the degree of caries, including the required experimental supplies, the design of cavity shape, the method and procedure of cavity making, and put forward the matters needing attention in the operation. After the preparation of isolated teeth, the team members observed, analyzed and commented on the preparation of the cavities of each tooth. After summarizing the lack of experience, they exchanged

and discussed, and the instructor summarized and commented. Such experiments reduce the dependence of students, improve their enthusiasm and responsibility, on the basis of basic operation training, so that the students' clinical thinking ability and ability to analyze and solve problems have been improved.

In the teaching process of caries cavity preparation, the traditional teaching mode is changed, the teaching method is adjusted appropriately, and the framework of multi-dimensional teaching method is established. By comparing the traditional experimental teaching method with the multi-dimensional experimental teaching structure in table 1, it can be seen that the new teaching mode can effectively enhance the teaching effect of caries cavity preparation, make students truly understand thoroughly, firmly remember, effectively guide the clinical practice with the theory, and conform to the modern advanced teaching concept.

Table 1 Comparison of teaching models

Numble	**Traditional experimental teaching**	**Multidimensional experimental teaching method**
Teacher	Knowledge imparters and classroom administrators	A guider or promoter of learning
Students	Passive receiver	Active researcher
Learning form	Class explanation and homework	Studying before class and solving problems in class
teaching method	Interpretation of knowledge	Independent learning, communication and reflection
Evaluation way	Give priority to examination results	Multi-angle, whole-process evaluation method

4. Conclusion

By summarizing our teaching experience and establishing the framework of multi-dimensional teaching method in the teaching process of cavity preparation of dental cavity, we can effectively improve students' clinical thinking discrimination ability and clinical problem finding and solving ability, improve their learning independence and lay a good foundation for clinical and scientific research work in the future. The framework of multi-dimensional teaching method can not only meet the needs of teaching reform, but also enhance the teaching effect. It has accumulated certain experience for the future reform of teaching method of oral medicine practice, and its teaching effect still needs to be further explored.

References

[1] Chen Chunyan, Guo Xiaokui, Application of the combination of traditional teaching method and PBL in the teaching of medical microbiology [J]. Chinese journal of microbiology. 2008, 35 (9): 1494-1496.

[2] Bian zhuan, Fan qingwen, Tai Baojun, et al. Application of PBL teaching in stomatology education [J]. Stomatology research, 2006, 22 (4): 448.

[3] Huang Zhengwei, Jiang Yuntao, Liang jingping. Application of PBL and CBL in the teaching of caries [J]. Southern medical education, 2012 (3): 36-38.

[4] Hu Guizhou, Xu Tongliang. Application of multimedia in clinical medicine teaching [J]. Medical informatics, 2008, 21 (1): 40-41.

[5] Thomas H Davis, Galen S Wagner, Gillbert Gleim, et al. Problem based leaning of research skill [J]. Journal of Electrocardiology, 2006, 39 (1): 120-128.

[6] Srinivasan M, Wilkes M, Stevenson F, et al. Comparing problem-based learning with case-based learning: effects of a major curricular shift at two institutions [J]. Acad Med. 2007, 82 (1): 74-82.