

# A Simple and Unique Method for Gaining Space Using Superelastic Nickel-Titanium Loop Archwire: Case Series

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## ABSTRACT

Orthodontic treatment requires space opening/ space gaining for the alignment of irregular or malposed teeth. The most commonly used method for the space creation or space opening is the use of Nickel-Titanium open coil spring. However, the main disadvantage of this spring is that the arches should be well aligned which usually takes 3-4 months before the placement of Nickel-Titanium open coil spring. This has led to the development of the technique of space opening right at the beginning of treatment with the help of Nickel-Titanium loop archwire. In this article, a U loop is made in the Nickel-Titanium archwire in the segment of the arch which requires space opening; sufficient amount of space was obtained within 3 months of inception of the treatment without the need of waiting for a stiffer archwire, thereby reducing the added duration of the treatment.

**Keywords:** Space gaining, Nickel-Titanium archwire, Nickel-Titanium open coil spring, Orthodontic treatment.

## INTRODUCTION

Space gaining or space opening is the most important step during Orthodontic treatment. [1] Conventional methods for space opening are the use of Nickel-Titanium open coil springs, uprighting of molars, use of orthodontic separators etc. [2,3] of which the most commonly used method is the use of Nickel-Titanium open coil spring. [2] The biggest advantage of the Nickel-Titanium open coil spring is that it delivers constant and gentle force. [2] However, the main drawback of coil springs is that the arches should be well aligned to receive a stainless-steel archwire which is possible only after a few months of alignment and levelling phase. [1] The present article demonstrates the use of Nickel-Titanium archwire which is modified in such a way to gain space along with the alignment phase.

## MATERIALS AND METHOD

Nickel-Titanium archwire is commonly used archwire during the

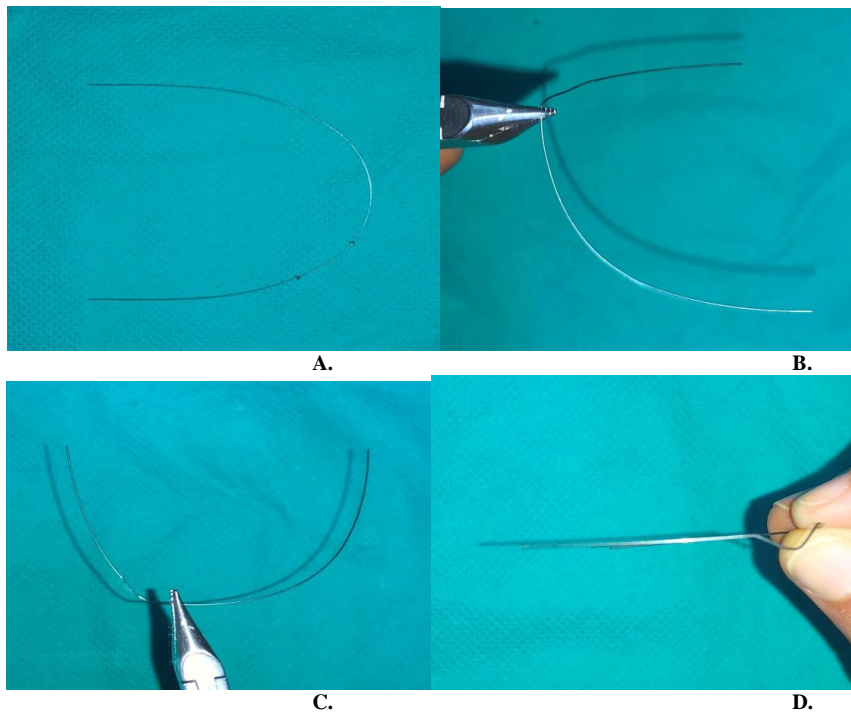
alignment and levelling phase of the treatment because of its property of spring-back, shape-memory archwire, and superelasticity. [4-6] In the present article, superelastic Ni-Ti archwire is used and it is modified by bending the U loop in the section of the arch which requires space opening. [5,6] Space is obtained by mesio-distal and labio-lingual movement of the teeth. The following cases illustrate the use of Superelastic Ni-Ti loop for gaining space in the treatment of patients.

Steps: (Figure 1)

1. Marking is done on the Nickel-Titanium archwire such that the distance marked is twice the amount of space required for bringing the malposed teeth into the alignment.
2. With the help of bird-beak plier a U loop is made in the archform.
3. While making the loop make sure that the arch symmetry is maintained.
4. During the placement of the archwire make sure that the wire ligated should be longer than the distal most bonded

tooth. The loop exerts gentle pressure on the teeth mesial and distal to it. After the ligation of the archwire, the patient is

reappointed after 30 days for reactivation and follow-up.



**Figure 1:** illustrates steps in making a loop in the Nickel-Titanium archwire. A. Marking the distance on the archwire. B-C. Bend is given in the archwire. D. Checking archwire symmetry.

### Clinical application of Nickel-Titanium loop archwire:

1. Space creation for the labially displaced maxillary canines and lingually displaced mandibular right lateral incisor.

Figure 2-4 shows space creation for the labially displaced maxillary canines. The Nickel-Titanium archwire loop is bent in the region of canines to open space for the blocked out canines. The resultant space obtained is by proclination in the anterior segment, expansion, and by distalization of premolars. Figure 5 shows intra-oral photographs of post debonding of the case.





Figure 2: Intra-oral photographs of Ni-Ti loop archwire placement in the upper and lower arches.



Figure 3: Intra-oral photographs of the upper and lower arches (2 months follow-up).



Figure 4: Intra-oral photographs of the upper and lower arches (4 months follow-up).



Figure 5: Intra-oral photographs of the upper and lower arches post debonding.

Space creation for blocked out mandibular right lateral incisor (figure 6).



Figure 6: Intra-oral photographs of Ni-Ti loop placed for gaining space for blocked out lateral incisor.

## DISCUSSION

Orthodontic treatment is divided into 3 phases: alignment and levelling, space closure and finishing and detailing.<sup>[1]</sup> Space opening/space creation is the most important step during orthodontic treatment. The present method of the study involves the use of Nickel-Titanium archwire which is modified in such a way that the space opening begins right at the initial stages of the treatment. The resultant space obtained is by proclination and expansion in the anterior segment and distalization of molars. This technique is cost-effective with minimum armamentarium and materials used.

### Limitations:

This method should not be used in cases with proclined anteriors.

The U loop can cause soft tissue irritation care must be taken while placing the loop in such a way that it does not impinge the oral mucosa.

## CONCLUSION

Thus, this new technique of space opening works at the beginning of the orthodontic treatment thereby aiding in the reduction of the treatment duration.

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