รายงานผู้ป่วย

การรักษาสำหรับทารกปากแหว่ง เพดานโหว่ทั้งสองข้าง

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Bilateral Cleft Lip and Cleft Palate

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บทคัดย่อ

หลักการและเหตุผล: ทารกที่มีปัญหาปากแหว่ง เพดานโหว่ จำเป็นต้องได้รับการรักษาเพื่อบูรณะความสวยงามของใบหน้า

วัตถุประสงค์: เพื่อรายงานการรักษาผู้ป่วยซึ่งเป็นทารกที่มีปัญหาปากแหว่ง เพดานโหว่ทั้งสองข้างอย่างสมบูรณ์

สถานที่ทำการศึกษา: คณะทันตแพทยศาสตร์ มหาวิทยาลัยขอนแก่น และโรงพยาบาลศรีนครินทร์ คณะแพทยศาสตร์ มหาวิทยาลัยขอนแก่น

การรักษา: การรักษาโดยใช้แผ่นเพดานเทียมและเทปคาดริมฝีปาก รวมทั้งเครื่องมือที่ เรียกว่า Naso-alveolar molding appliance ก่อนการผ่าตัด ทารกได้รับการผ่าตัดโดยบูรณะสันเหงือก, ริมฝีปาก และจมูกในครั้งเดียว

ผลการรักษา: ผลการรักษาอยู่ในเกณฑ์ดี พบว่าผู้ป่วยมีความสวยงามของริมฝีปากและจมูกอยู่ในเกณฑ์ที่ดีกว่าปกติ

สรุป: ผู้ป่วยเด็กสัญชาติไทย อายุ 15 วัน ภูมิลำเนาจังหวัดขอนแก่น มาพบแพทย์ ณ โรงพยาบาลศรีนครินทร์ มหาวิทยาลัยขอนแก่น ด้วยปัญหาปากแหว่ง เพดานโหว่ทั้งสองข้างอย่างสมบูรณ์ กล่าวคือ มีรอยแยกในส่วนเพดานปฐมภูมิทั้ง 2 ด้านซ้ายและขวา และมีรอยแยกในส่วนเพดานทุติยภูมิแบบสมบูรณ์ ผู้ป่วยได้รับการรักษาในเบื้องต้นก่อนการผ่าตัดเพื่อช่วยลดปัญหาในการดูดนมและจัดเรียงตำแหน่งสันเหงือกและเพดานปฐมภูมิโดยการใช้เพดานเทียม (obturator) และแผ่นเทปคาดริมฝีปาก (lip strapping) รวมทั้งได้รับการรักษาโดยใช้แผ่นเพดานเทียมที่ เรียกว่า naso-alveolar molding appliance (NAM) เพื่อช่วยเพิ่ม ความสวยงามของจมูกส่วนล่างโดยการยืดเนื้อเยื่อบริเวณ columella การรักษาโดยวิธีนี้ช่วยลดระยะทางระหว่าง prolabium และ lateral lip segments ดังนั้น จึงช่วยลดแรงตึงของริมฝีปากบนขณะและหลังทำการผ่าตัดเย็บริมฝีปาก หลังจากนั้นผู้ป่วยได้รับการผ่าตัดแบบพิเศษโดยการผ่าตัด

Abstract

Background: Infant born with cleft lip and cleft palate problem requires treatment to restore the integrity of facial soft tissue

Objective: The objective of this article is to present a treatment procedure for the bilateral complete cleft lip and cleft palate infant.

Setting: Orthodontic Department, Faculty of Dentistry, Khon-Kaen University and Srinagarind Hospital, Faculty of Medicine, Khon-Kaen University

Intervention: The initial treatment used a presurgical orthopedic appliance. The surgical treatment comprised gingivoperiosteoplasty, primary lip and nasal reconstruction, all done in one-stage.

Results: A better early facial soft tissue esthetics was achieved.

Conclusion: A Thai male infant, aged 15 days, born in Khon-Kaen Province, came to Srinagarind Hospital with the problem of complete bilateral cleft lip and cleft palate. An obturator with lip strapping was delivered in order to help with the feeding problem. At the same time, this appliance was used to mold the primary palate and lateral palatal segments into a better relationship, and to lessen the gap width of the cleft. The reduced distance between the prolabium and lateral lip segments helped decrease soft tissue tension during and after lip repair. Besides, a special appliance, the Naso-Alveolar Molding appliance (NAM) was used for this baby in order to help molding the alar cartilages and extending the columella length before the surgery. A one-stage surgery combining the gingivoperiosteoplasty, lip and nasal reconstruction was performed. The result of this coordinated treatment brought about better early esthetics of the soft tissue lip and nose.

บูรณะสันเหงือกที่โหว่, ริมฝีปากและจมูกในครั้งเดียว ผลการรักษาหลังผ่าตัดพบว่าผู้ป่วยมีความสวยงามของริมฝีปากและจมูกอยู่ในเกณฑ์ที่ดีกว่าปกติ

Keywords: Nasoalveolar Molding Appliances. Bilateral Cleft Lip and Cleft Palate. Presurgical Orthopedics. Primary lip and nose reconstruction. Gingivoperiosteoplasty

ศรีนครินทร์เวชสาร 2544; 16(1), 1-8 • Srinagarind Med J 2001; 16(1), 1-8

Introduction

Clinicians have put great effort to find out the best rehabilitation program for cleft lip and cleft palate patients. Large variation of treatment protocols for this group of patients have been implemented among different cleft centers. Regarding the early esthetics during the first year of life of these children, surgical operation (cheiloplasty) to restore the upper lip integrity is required. One of the treatment approaches using presurgical orthopedic appliances or the obturator has been performed in some cleft centers. The appliance may be classified according to the function of the appliance itself as a passive or active obturator[1]. The active appliances vary from simplistic straps placed over the primary palate to complex intraoral mechanical devices such as the Latham appliance[1]. The objective of using these appliances is for assisting feeding. The other objective is to help repositioning the primary palate and/or the lateral palatal(alveolar) segments before the surgical procedure. Molding the primary palate in complete bilateral cleft lip and cleft palate can also be done by several treatment regimens. Rosenstein et al. used a combined passive appliance and surgical lip adhesion in order to mold the primary palate prior to definitive lip repair[2]. By setting up the plaster model, Robertson used the active alveolar molding appliance to reposition the displaced maxillary segments prior to surgical repair of the lip[3]. Reduction of the cleft width and good alignment of the palatal segments lessens the distance between the prolabium and lateral lip segments. Decreased tension of the soft tissue during and after surgical lip closure brings about better soft tissue esthetics.

Cutting and Grayson of the New York University Medical Center presented a unique treatment procedure for the bilateral cleft lip and cleft palate infant. Grayson utilized the presurgical alveolar molding appliance to bring the protruding primary palate back into proper alignment with the lateral palatal segments[4]. The appliance comprised an arylic plate, using in conjunction with external tape and elastics, serving as a feeding and orthopedic appliance at the same time. In order to actively move the lateral palatal segments, the appliance was to be adjusted every week by adding and relieving acrylic over the acrylic plate. Once the desired position of the primary palate and lateral palatal segments were achieved, and the gap width between the segments was reduced, the second appliance called the Naso-Alveolar Molding appliance was used[4]. This presurgical nasal molding phase produced tissue expansion of the short columella and nasal lining. The surgical approach as described by Cutting was a coordinated operation involving a one stage repair of the lip, nose and alveolus[5,6]. Gingivoperiosteoplasty as described by Millard was also done[7]. A satisfying esthetic result from the procedure was achieved.

The purpose of this article is to report a case of complete bilateral cleft lip and cleft palate. A modified approach similar to the procedure as described by Cutting et.al. was performed for this baby. The treatment involved the presurgical orthopedic phase using an obturator and active lip strapping followed by a naso-alveolar molding appliance. The first surgical procedure involved the gingivoperiosteoplasty, lip and nasal reconstruction, all in one operation. Details and result of this treatment are presented.

Case Report

A Thai male infant aged 15 days, birth weight of 3300 grams, came to Srinagarind Hospital, Khon-Kaen University with chief problem of feeding difficulty. The baby was born with bilateral cleft lip and cleft palate. The mother, 18 years old, had no significant medical problems nor systemic diseases. There was no history of craniofacial clefts either in her or her husband's family. Her pregnancy records were uneventful. This baby was her first child.

The baby had a complete bilateral cleft lip and cleft palate (fig 1A). No other abnormalities were detected. The baby so far had been on spoon-fed. His primary palate was protruded with its position lying above the lateral segments of the lips (fig 1B). The primary palate was rotated with the left side more advanced than the right (fig 1C). The nasal septum was deviated to his left side. The size of the bony primary palate was relatively large that it almost completely occluded his left nostril. The prolabium was relatively small. The lateral palatal segments were slightly constricted. The gap between the premaxilla and anterior part of the lateral palatal segment on the left side was 2 mm. and on the right side approximately 4 mm.

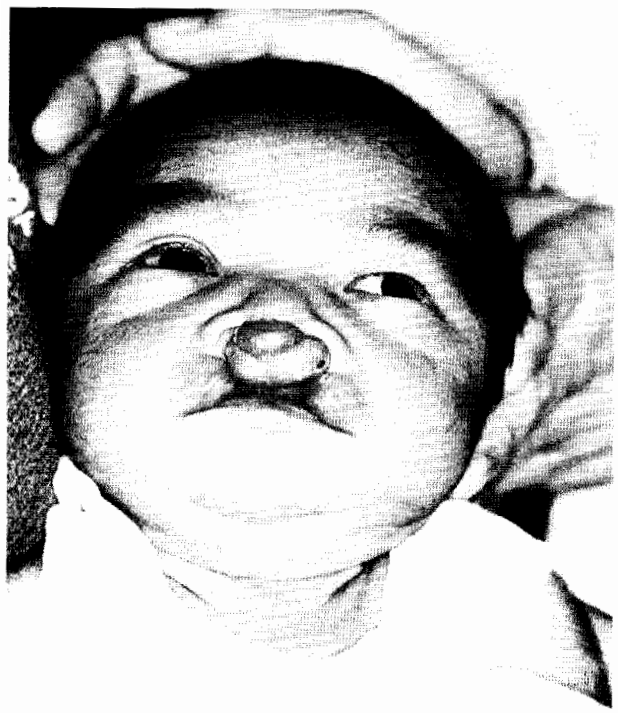

Figure 1A Frontal view of the infant at 15 days old.

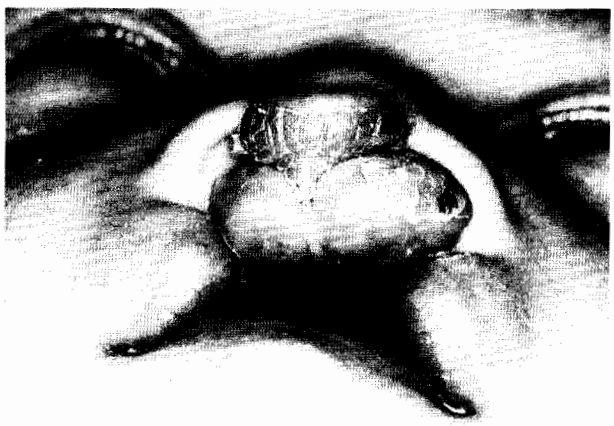

Figure 1B Closed up view of primary palate of the infant at 15 days old.

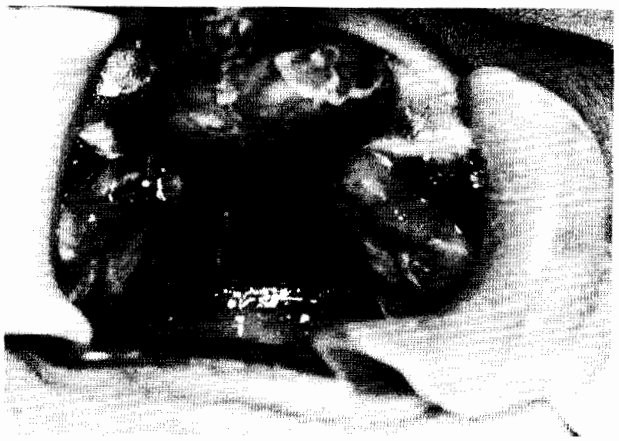

Figure 1C Intraoral view demonstrated complete cleft of the primary and secondary palate. Nasal septum was deviated to the left side.

Treatment

The treatment consisted of a presurgical orthopedic phase followed by the surgical phase.

Presurgical orthopedic phase

Because of the problem of feeding difficulty, it was decided to deliver an obturator plate for the baby. The other objective was to derotate and move the primary palate posteriorly. Impression of primary and secondary palate was made with a fast-setting alginate impression material in a perforated, triangular-shaped, acrylic tray. The impression was taken while the baby was in an upright position. In order to lessen the problem of alginate tearing, which could be life threatening due to airway blockage, a piece of gauze was sandwiched inside the alginate. The impression was poured with stone; thereafter, an acrylic obturator plate was made. The obturator plate had extra-oral ,0.8 mm diameter, stainless steel wire extension. The plate had no labial flange extension over the prolabium nor the bony primary palate. This plate surved the purpose as a combined feeding and alveolar molding plate. The appliance was checked and adjusted for baby comfort. Acrylic between the lingual aspect of the primary palate and lateral palatal segments was also relieved to allow migration of primary palate in a posterior direction and growth of the palatal segments in an anterior direction. The extra-oral wire extensions were adjusted to conform to the contour of the baby's cheeks using three prongs plier. Three pieces of Micropore or Transpore tape cut in square shape, size 1x1 inch, were placed over the forehead , and on right and left cheeks of the baby. Tincture benzoin was applied to the cheek to prevent excoriation of the skin. The obturator was held in place, first to the right and the left cheek via the extra-oral wire extensions, then toward the forehead via dental floss tieing over the anterior portion of the extra-oral wire extensions.

Lip strapping using Elastoplast® was made and taped over the right and left cheek, crossing over the prolabium. The mother was instructed to gently squeeze the baby's cheeks together toward the midline in order to tighten up the lip strapping. The lip strapping would work, due to its elasticity, exerting light continuous force in posterior (lingual) direction against the primary palate. The baby was to wear the obturator plate all the time. Instruction was given to clean the obturator using clean water and liquid soap. the sticky residue of tape over the baby's face could be cleaned up using liquid soap. The Elastoplast® lip strapping was to be changed daily or

whenever it was soiled. Figure 2 demonstrates the obturator appliance with lip strapping. Bottle feeding using the mother's breast milk was suggested.

Figure 2 The obturator appliance with lip strapping.

The baby was appointed a week later at 21 days old. Except for slight diificulty breathing at night, the baby complied very well and was able to take more milk, according to the mother's report. The mouth was again checked and any sore spot relieved. The plate was also adjusted by adding and relieving the acrylic part to allow some expansion of the lateral palatal segments. Two weeks after obturator delivery, some difficulty breathing at night time still persisted which might be probably due to partially occluded nostrils, especially on the left side. Therefore, a few small holes size 3x3 mm. were made on the palatal aspect of the obturator. A Second accessory elastoplast tape was added to the left side, pulling and rotating the primary palate more toward the posterior and left side.

The fourth appointment was made when the baby was 1 month and 28 days old. At this time the gap between the primary palate and anterior aspect of the lateral palatal segments was minimal, approximately 2 mm on the left and 0.5 mm on the right side. A Second impression was made for the Naso-Alveolar Molding appliance. The appliance had two acrylic nasal extensions with 0.8 mm diameter stainless steele core. The springiness of the proximal part of stainless steele core, together with a wire loop bending allow easier placement and removal of the appliance into the nostrils and mouth. The nasal molding parts helped to lift up the nasal tip and stretch the soft tissue columella (fig 3). Lip strapping was continued. Follow-up at the fifth appointment demonstrated good compliance.

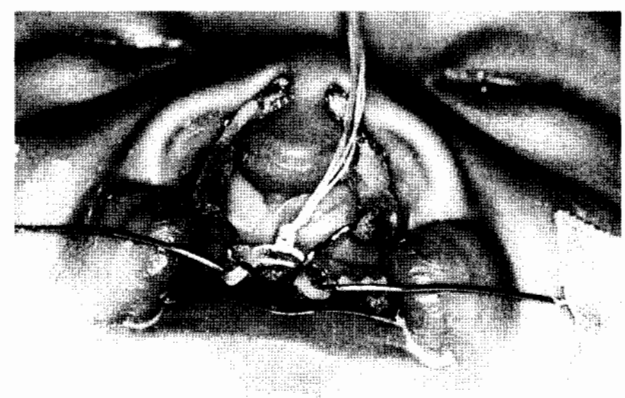

Figure 3 Naso-alveolar molding appliance.

When the baby was 2 months and 18 days, the length of the nasal molding prongs were extended upward approximately 2 mm. longer. It was observed at this time that the primary palate had been moved posteriorly lying below the lateral lip segments (fig 4A). The previous gap between the premaxilla and the lateral palatal segments had been closed both on both sides. The primary palate had been derotated and was properly aligned to the lateral palatal segments (fig 4B). This enhanced effect of gap closure and rotation was probably due to the pressure from lip strapping over the nasal prongs which had some contact over the primary palate.

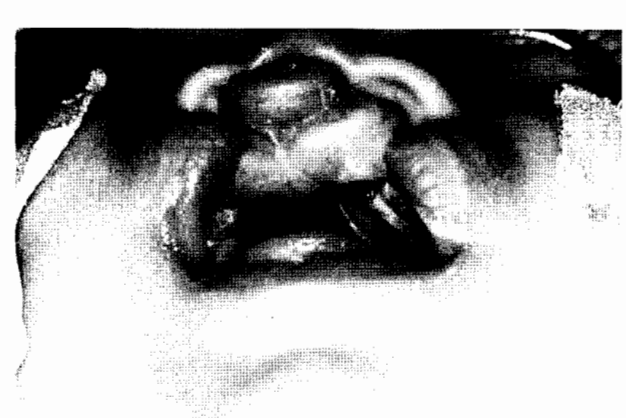

Figure 4A At 2 1/2 months old, the primary palte had been moved posteriorly.

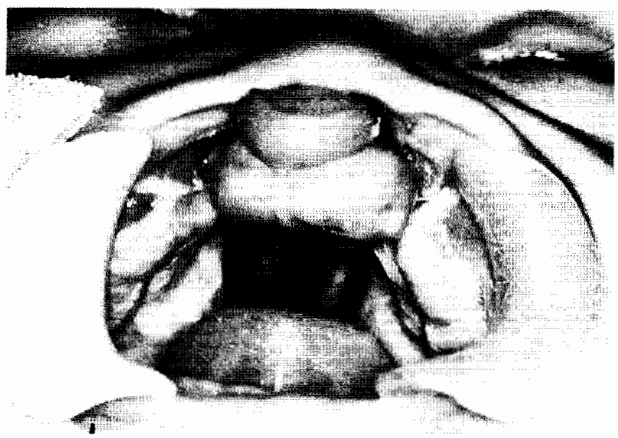

Figure 4B Closed up view of primary palate demonstrated closure of the gaps between the premaxilla and lateral palatal segments.

The patient was admitted for operation when he was 5 months and 17 days. He actually was admitted about a week earlier, however, the operation schedule had been postponed for a few times, and during this waiting period, he had not worn the appliance and lip strapping. We noticed some relapse on the operating day. The gap on the left side which was previously closed had reopened for approximately 1.5 mm.

Surgical Phase

The patient was brought to the operating room in a semi-sedated state. Under general anesthesia, he was oro-endotracheally intubated without complications. The patient was prepared and draped in the usual sterile fashion for an intraoral and facial surgical procedure.

The one-stage gingivo-periosteoplasty ,primary lip and nasal reconstruction, similar to the procedure reported by Cutting et al. was performed. First, the incision line was marked over the prolabium, lateral lip segments and the nose. Attention was first directed to perform gingivoperiosteoplasty procedure by starting first on the right side (fig 5A). Vasoconstrictor and local anesthetic was infiltrated at the tissue along the cleft. The incisions in the area of cleft site were designed in such a fashion that it would allow for a two layer closure along the cleft. Inversion of the nasal and oral tissues was done to create the flaps for new nasal floor and oral closure. The nasal floor was reconstructed by suturing the inverted cuff of tissues with interrupted 4-0 Vicryl sutures. Elevation and suturing of the oral flap for primary oral closure was then performed. Scoring of the periosteum of the flap was kept at minimum, only necessary for adequate mobilization to close the cleft. The gingivoperiosteoplasty was then repeated on the left side. Due to a wider gap (approximately 2 mm) on the left side, more undermining of the sublabial tissue to free up the flap was necessary.

Figure 5A Gingivoperiosteoplasty

The next step was to perform nasal reconstruction.

Marginal incisions were made on both sides. Using fine dissecting scissors, the right and left lateral crura were dissected away from the overlying skin and fibrous tissue. A transfixion incision was made to allow access to the dorsum. Subcutaneous fat was then dissected out from between the nasal dome cartilages. Thereafter, the dome cartilages were sutured together in the midline with resorbable sutures and the nasal incisions were closed. Lip repair was then carried out. The incisions on the prolabium and lateral lip segments were identical to banked forked flap design (fig 5B). Orbicularis muscle and vermillion of the lateral lip segments were sutured. Nasalis muscle on the right and left side were cinched together at the anterior nasal spine. Next, the prolabial flap was sutured interposing between the lateral segments of the lip to create the philtrum. Nasal sills were sutured using the lateral forked flap.

Figure 5B The incisions on the prolabium and nostrils

Finally, the nasofacial groove was defined by placing several sutures through the alar, inside the nose and brought out externally tying over gauze packs in order to

straddle the alar (fig 5C). The operation was then complete. All soft tissue edges were noted to be well approximated and adequately closed.

Figure 5C Several sutures were placed over the alar.

There were no complications after surgery and the baby was discharged 2 days later. Instruction was given to the mother to spoon-feed the baby for a few weeks. During this immediate healing period, special care woud be taken by the family to keep the baby's hands and all hard and semi-hard objects away from his mouth.

Follow up results

Suture removal was done 2 weeks after the surgery. The surgical site showed good healing. Only slight crust formation was present at the nostrils and the left nasal sill. Slight redundant lip tissue was present which might be used later for creating gingivobuccal sulcus. Early soft tissue esthetics was remarkable with a nicely defined nasal tip projection (fig 6), adequate columella length and nice lip form. Figure 7A,B demonstrates the baby's face 3 months and 10 days after surgery. The presurgical orthopedic appliance was terminated after the surgery.

Figure 6 Closed up view around the nose and upper lip, 2 months after surgery

Figure 7 A, B Frontal view of the infant 3 months 10 days after surgery.

Discussion

This baby was treated with the presurgical orthopedic appliance which comprised an obturator and lip strapping since he was 15 days old. At the age of approximately 2

months old, the naso-alveolar molding appliance was used to help extending the columella length. A one stage gingivoperiosteoplasty, primary lip and nose surgical correction was performed when he was 5 months old. A good soft tissue esthetic result was achieved. However, there was a price to pay for this nice result. During the phase of the presurgical orthopedic appliance, good co-operation of the family was very essential to the treatment. In contrast to a passive obturator, more effort had to be exerted by the family with daily appliance insertion and active lip strapping. We have tried the Elastoplast lip strapping as the active component for moving the primary palate rather than acrylic adjustment in the hope to reduce the number of appliance adjustment visits.

Early correction of the nasal deformity has been advocated by some authors. The strategy is to construct the columella and nasal tip by anatomic positioning of the alar cartilages and sculpting the investing skin. The nasal correction is done at the time of bilateral labial repair and whenever possible, the alveolar clefts are closed at the same time. In regard to the surgical result in this case, the positive effects of primary nose correction was observed. Although not rounded, we observed less splay of nostril shape. The nostril contour coud have been better had we discarded the lateral fork flap and cinched the alar base more. Contrary to other cases we had treated in the past, the nasal tip in this case was not rotated downward but demonstrated nice upward and well defined projection. We have found that the columella length in this case was better than those achieved after conventional chieloplasty.

Some clinicians believe that presurgical maxillary orthopedics has greatly facilitated the primary repair of primary palate. Aligning the maxillary segments helps provide a better skeletal platform for naso-labial soft tissue correction. However, it should be noted that debates continue over the outcomes and benefit of presurgical maxillary orthopedics.

Conclusion

The problems encountered in infants born with cleft lip/cleft palate pose several challenging situations for the healthcare personnel involved in the treatment from infancy to adulthood. The primary goal of the treatment for the infant born with cleft lip/cleft palate is first to lessen feeding difficulty and promote good nourishment. The next concern is for the facial esthetics, speech, growth and development of the facial skeleton, etc. As shown in the history of cleft lip/cleft palate treatment, several approaches have been attempted with the aim to seek the best treatment strategy for the patient. However, there have been no definite answers as to which treatment strategy would be the most appropriate. As controversy continues, ongoing clinical research with long-term follow-up are needed.

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