

November 2023 in Hochiminh city, Vietnam

Butterfly Technique in Mitral Valve Repair

Tohru Asai

Shonan Kamakura General Hospital

No Conflict of Interest

Mitral Repair in 2023

More simplified techniques are generally preferred with Trend in MICS

Neo-chordal implantation >> Resection

Partial Ring/Band >> Complete Ring

However, degenerative morphology is variable in degree of disease.

If you only use non-resectional strategy, you can't resect leaflet when needed.

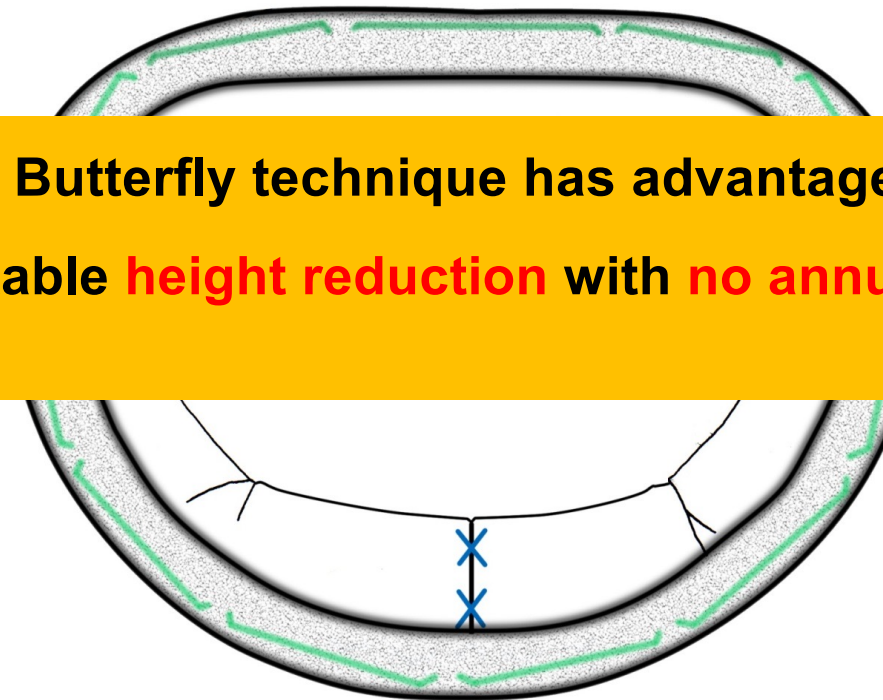
Master surgeons use both resection and neochords whenever needed.

You need to know: when and how.

Resection technique and Non-resection technique, Both. Principles. Indications

A Novel Design of Posterior Leaflet Butterfly Resection for Mitral Valve Repair

Tohru Asai, MD, PhD, Takeshi Kinoshita, MD, Osamu Nishimura, MD, Atsushi Kambara, MD, PhD,
Tomoaki Suzuki, MD, PhD, and Keiji Matsubayashi, MD, PhD
(*Innovations* 2011;6:54–56)



**Butterfly technique has advantage:
The adjustable **height reduction** with **no annular plication****



2022 Mitral Conclave, Yokohama, October 8, 2022

Degenerative Mitral Valve Disease and Repair: Butterfly Technique

Rationale and Impact of Butterfly Effect

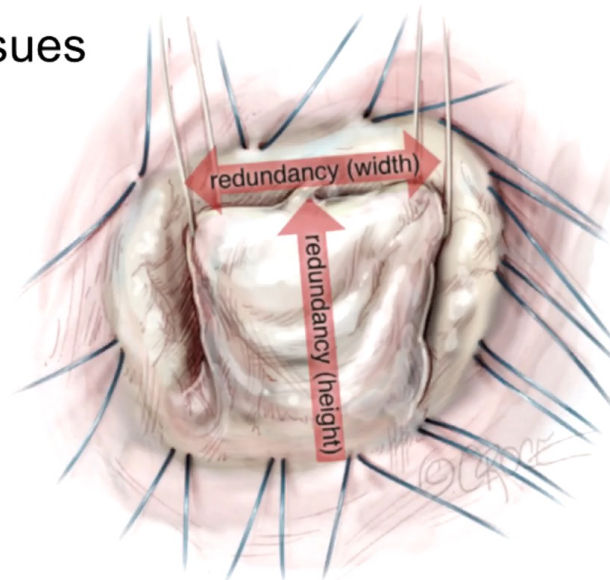
Tohru Asai
Juntendo University, Tokyo, Japan

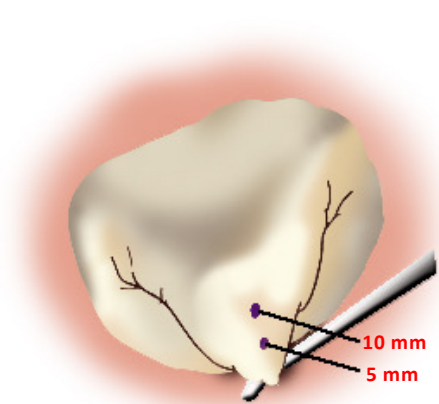
Disclosure: No relevant financial relationships

**Butterfly Technique and its variations
in complex Barlow's Disease Repair?**

Barlow disease features

- Billowing of excessive leaflet tissues (width, height, & thickness)
- Mitral annular dilatation
- Mitral annular disjunction (MAD)
- Stiffening/calcification of leaflet and/or annulus

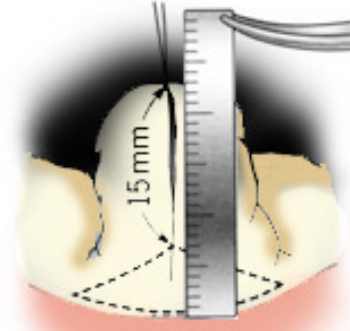




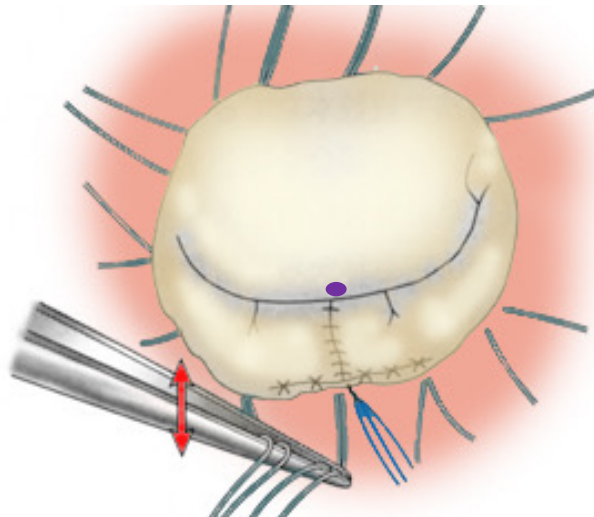
We mark "A2 depth indicator", 5 mm and 10 mm from the free edge of A2.



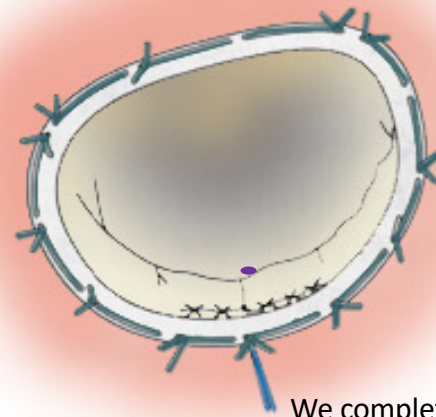
Triangular resection is carried out at the prolapsing segment.



Butterfly technique is indicated when the approximated height is **over 20 mm**.



Move the annular suture (6 o'clock) up and down. We choose a size of an annuloplasty ring when you see only "one ink dot."



We complete annuloplasty with designated length of coaptation.

Tips & Tricks for Butterfly Technique

- Degenerative mitral disease always have **variable leaflet redundancy (height, width)**.
- Always **measure heights** of all leaflet segments.
- For prolapsing posterior segment, I **start with triangular resection, approximate cut margins and measure the height** again.
- Use Butterfly Technique if height is **more than 20 mm**.

Spectrum of PLP Resection Strategies depending on leaflet height

There is almost always leaflet tissue redundancy in degenerative posterior leaflet prolapse!



In Classic Resection Strategy (with Annular Plication/Compression)

Sliding Leaflet Technique ↔ Quadrangular Resection ↔ No Resection

In Contemporary Resection Strategy (**without** Annular Plication/Compression)

Butterfly Technique ↔ Triangular Resection ↔ No Resection

Does resection technique cause smaller MVA?

There is increasing reports showing that **non-resection technique** has advantages over **resection technique** such as larger area of coaptation, larger implanted ring size, longer line of coaptation or lower MV gradient. [These resection techniques were **Quadrangular resection** and/or **sliding leaflet technique**]

Chordal Replacement Versus Quadrangular Resection for Repair of Isolated Posterior Mitral Leaflet Prolapse

Ruediger Lange, MD, PhD, Thomas Guenther, MD, Christian Noebauer, MD, Birgit Kiefer, MD, Walter Eichinger, MD, PhD, Bernhard Voss, MD, Robert Bauernschmitt, MD, PhD, Peter Tassani-Prell, MD, PhD, and Domenico Mazzitelli, MD

Departments of Cardiovascular Surgery and Anesthesiology, German Heart Center Munich, Clinic at the Technical University Munich, Germany

Perspective

Chordae replacement versus leaflet resection in minimally invasive mitral valve repair

Tomas Holubec, Simon H. Sündermann, Stephan Jacobs, Volkmar Falk

Division of Cardiovascular Surgery, University Hospital Zurich, Zurich, Switzerland

Corresponding to: Tomas Holubec, MD. University Hospital Zurich, Rämistrasse 100, CH-8091 Zurich, Switzerland. Email: tomas.holubec@usz.ch.

Chordae Replacement Versus Resection for Repair of Isolated Posterior Mitral Leaflet Prolapse: À l'Égalité

Joerg Seeburger, MD, Volkmar Falk, MD, PhD, Michael A. Borger, MD, PhD, Jurgen Passage, MBBS, FRACS, Thomas Walther, MD, PhD, Nicolas Doll, MD, PhD, and Friedrich W. Mohr, MD, PhD

Heart Center, Leipzig University, Leipzig, Germany

ORIGINAL ARTICLE

JOURNAL OF
CARDIAC SURGERY WILEY

Clinical impact of the repair technique for posterior mitral leaflet prolapse: Resect or respect?

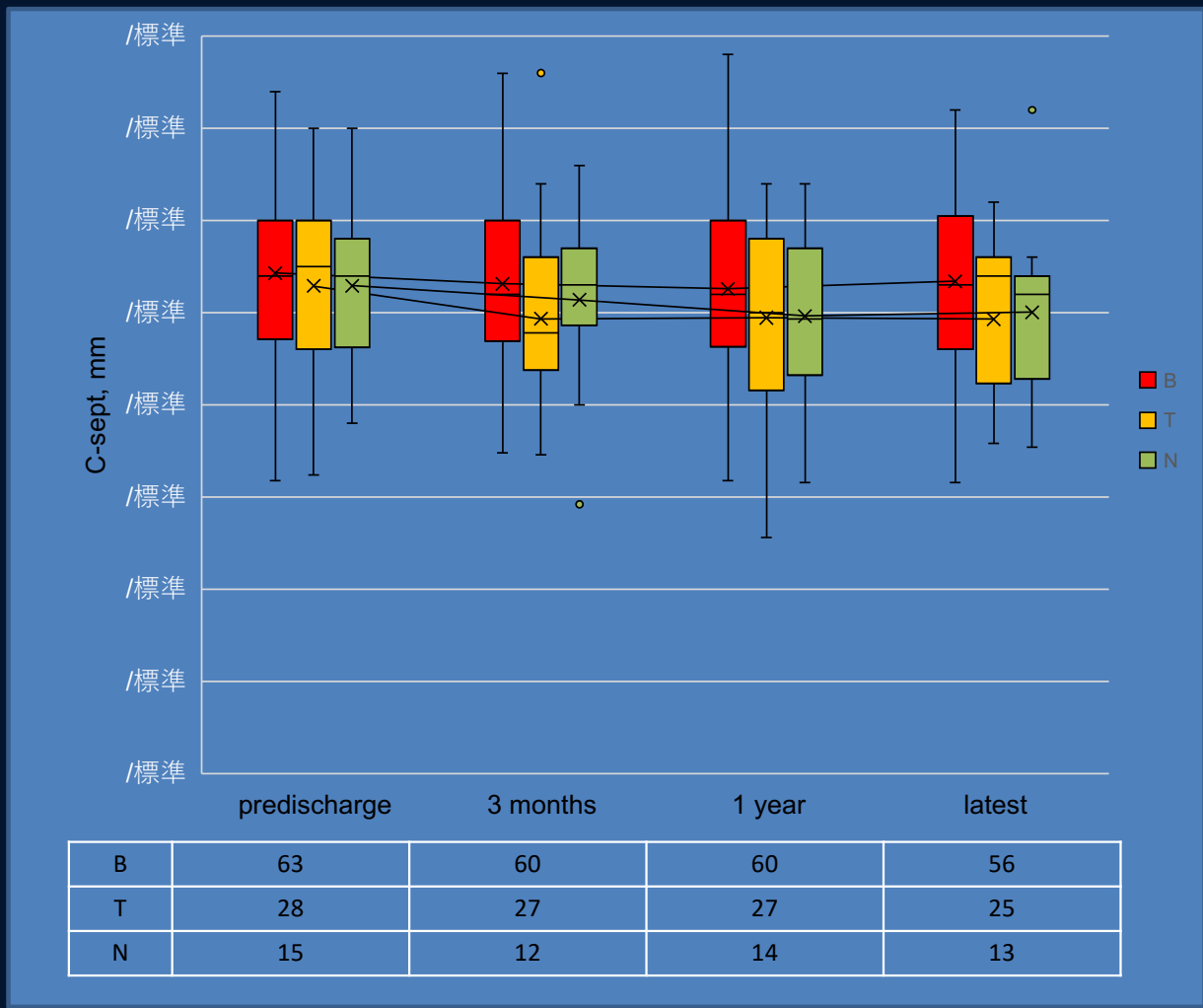
Taichi Sakaguchi MD, PhD¹ | Arudo Hiraoka MD, PhD² |
Toshinori Totsugawa MD, PhD² | Akihiro Hayashida MD, PhD³ |
Masaaki Ryomoto MD, PhD¹ | Naosumi Sekiya MD, PhD¹ |
Genta Chikazawa MD, PhD² | Hidenori Yoshitaka MD, PhD²

How about **butterfly technique** and **triangular resection**? Do they reduce MVA or ring size?

Butterfly resection vs. Triangular resection vs. neochordaoplasty

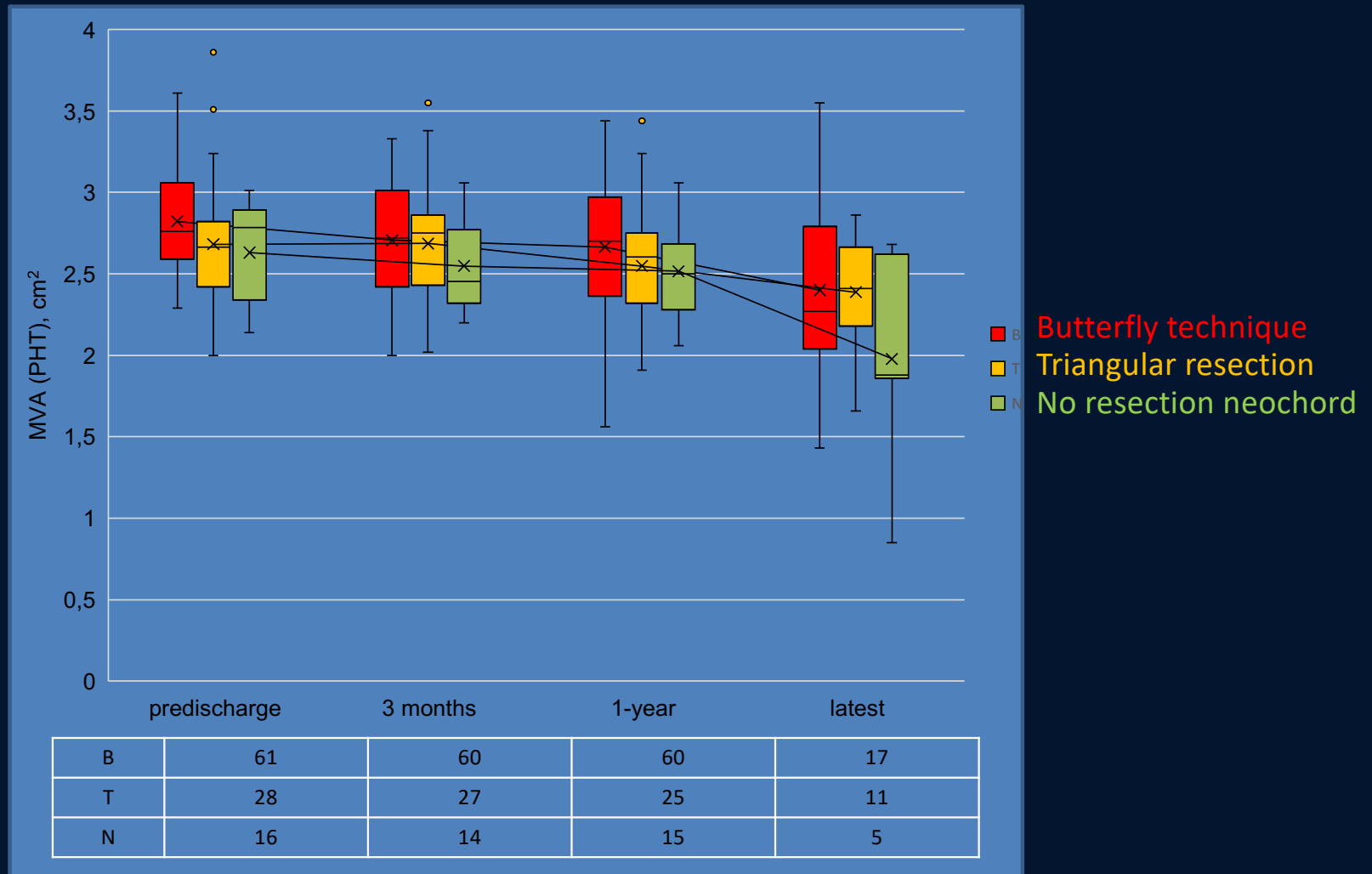
- We repaired 109 posterior leaflet prolapse using
 - butterfly resection (B resection; n = 64, 58.7%),
 - triangular resection (T resection; n = 28, 25.7%) or
 - no resection (N resection; n = 17, 15.6%) and compared results.
- We chose one of 3 techniques based on direct measurement of the PLP height.
- C-Sept and MVA were followed by echocardiography.

Postoperative follow-up distance from the coaptation to the septum (C-sept)



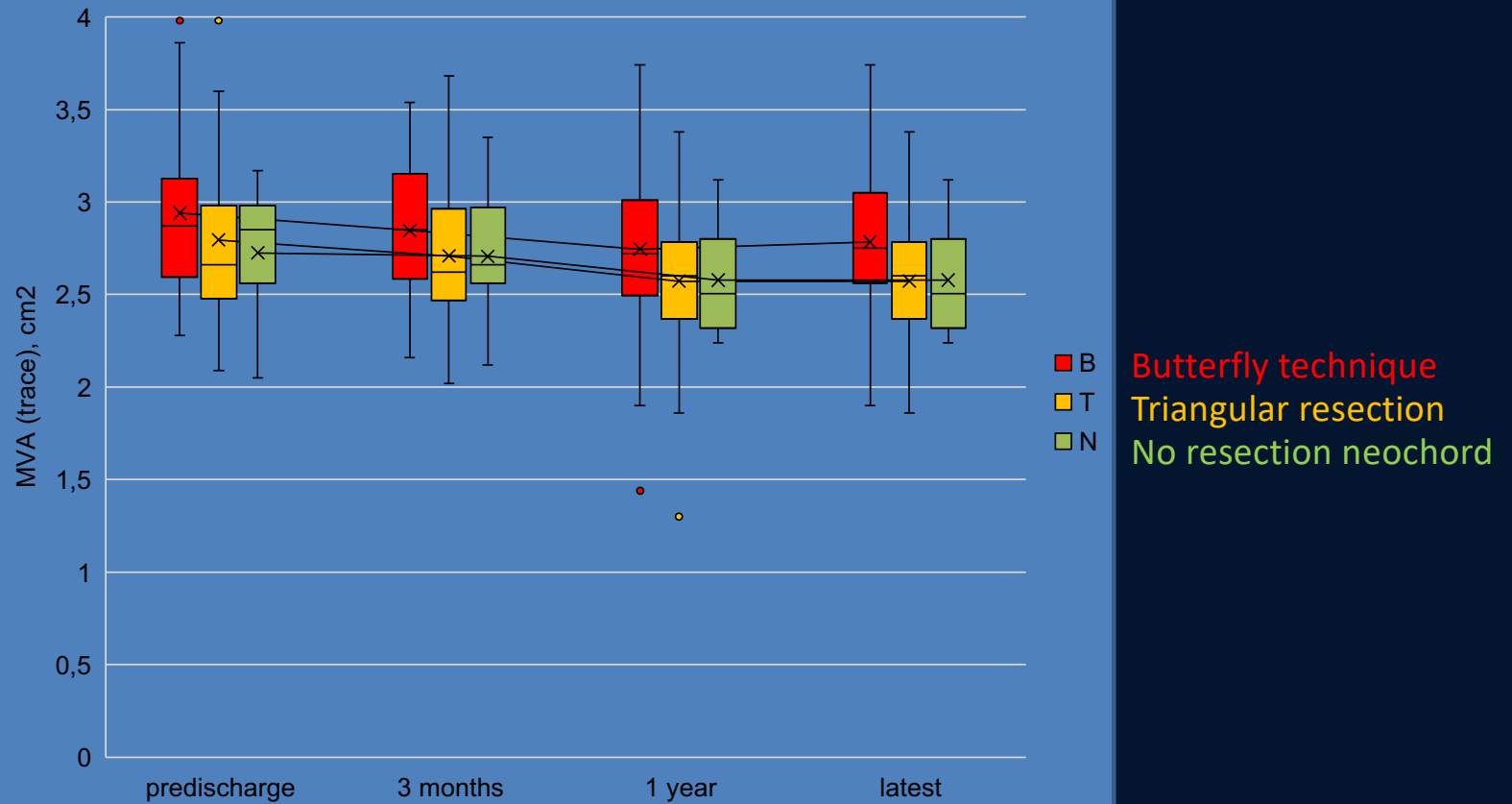
The C-sept was constant after surgery and no significant difference was found among the three groups

Mitral valve area (MVA) calculated from pressure half time (PHT)



No resection group had significantly higher incidence of MVA reduction following MV repair

Mitral valve area (MVA) measured by tracing.



B	59	60	75	61
T	25	28	28	28
N	16	13	13	13

The MVA was constant after surgery and no significant difference was found among the three groups

Butterfly Technique and its variations
does not reduce Mitral Valve Area
no increase in gradient!

Compared with no resection with
neochordoplasty

A close-up photograph of a butterfly with yellow and black wings, perched on a pink flower. The butterfly's wings are spread, showing a pattern of black stripes on a yellow background. The flower is in the foreground, and the background is a soft, out-of-focus green. The text "Resect with Respect!" is overlaid in yellow, and "To be an expert of mitral valve repair, Respectable resection is inevitable!" is overlaid in white.

Resect with Respect!

To be an expert of mitral valve repair,
Respectable resection is inevitable!