

A New Regenerative Therapy Of Elastic Cartilage Grafting For Craniofacial Deformities

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Nothing to disclose

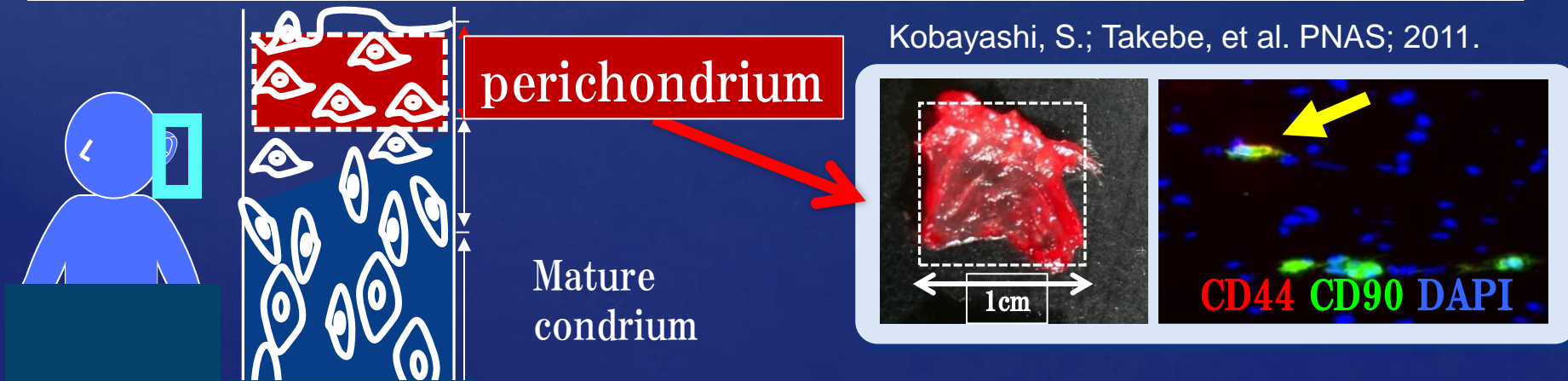
Background

Limitation of self-cartilage grafting

- Collectable volume limitations
- Long-term tissue maintenance failures

Regenerative method is desired!!

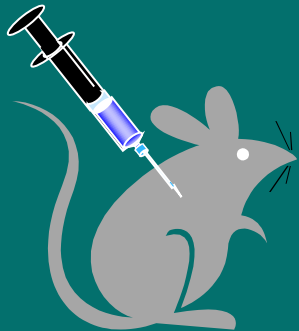
We reported **cartilage progenitor cells in ear perichondrium**



Background: Reconstructed elastic cartilage in vivo

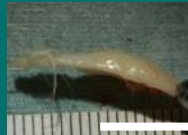
Xeno-transplantation

Immuno-
-deficiency
Mice

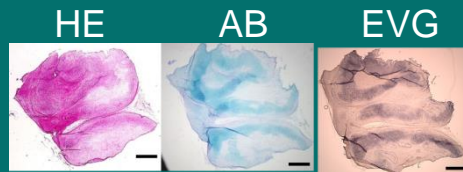


Injection

self-renewing elastic cartilage



Scale bar 10mm

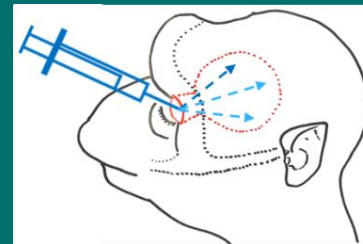


Scale bars: 1000µm

Kobayashi, S.; Takebe, et al, Reconstruction of human elastic cartilage by a CD44+ CD90+ stem cell in the ear perichondrium. Proc. Natl. Acad. Sci. USA 108(35):14479-14484; 2011.

Auto-transplantation

Immuno-
-competent
Monkey

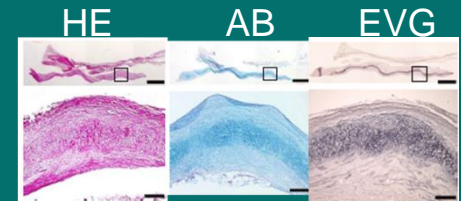


Injection

self-renewing elastic cartilage



Scale bar 10mm



Scale bars:

macro 10 mm, micro 200 µm

Shintaro Kagimoto et al, Autotransplantation of monkey ear perichondrium-derived progenitor cells for cartilage reconstruction. Cell Transplantation 25(5):951-62, 2016

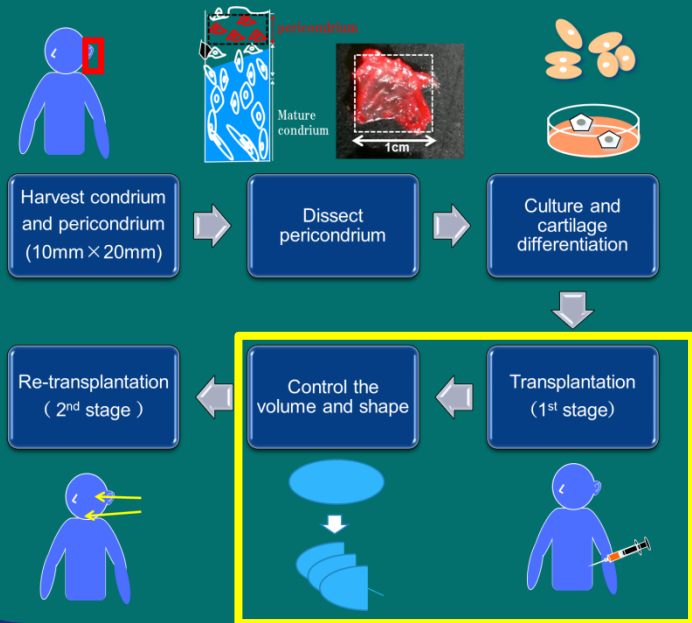
Volume and shape of self-renewing elastic cartilage is out of control in these methods.

Objective of the study:

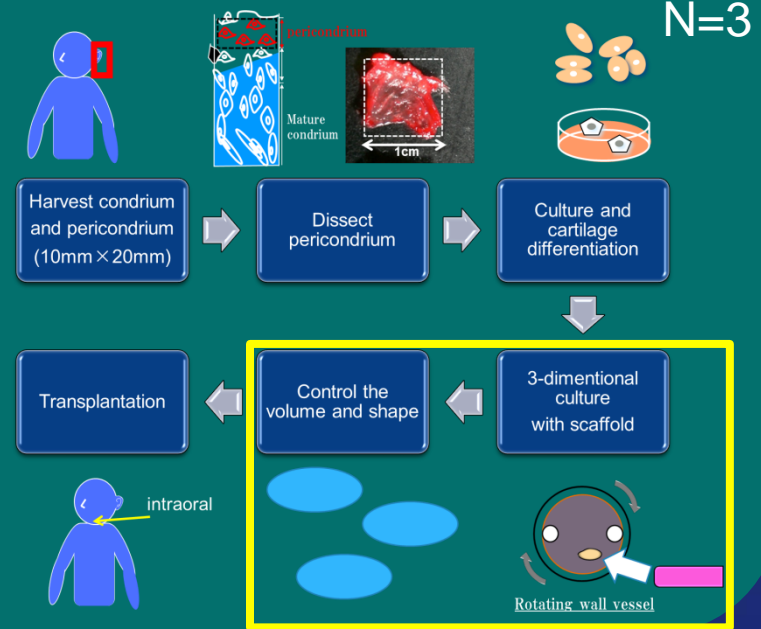
To control the volume and shape of self-renewing elastic cartilage

Materials and methods: Three monkeys (*Macaca fascicularis*)

Two stage grafting N=3



3-dimentional culture N=3



※ The experimental animal protocols were approved by the Animal Welfare and Animal Care Committee of the National Institute of Biomedical Innovation (Osaka, Japan)(approval ID: DS25-32).

Results and conclusions:

- **We can control** the volume and shape of self-renewing elastic cartilage **in both of 2 groups**

Two stage grafting

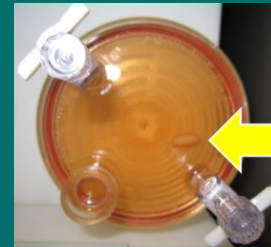


Control volume and shape

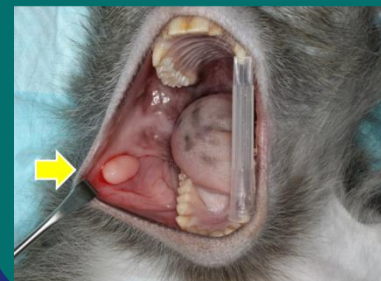


Scale bar 10mm

3-dimentional culture



Control volume and shape
(cultured plural cartilage
in vitro)

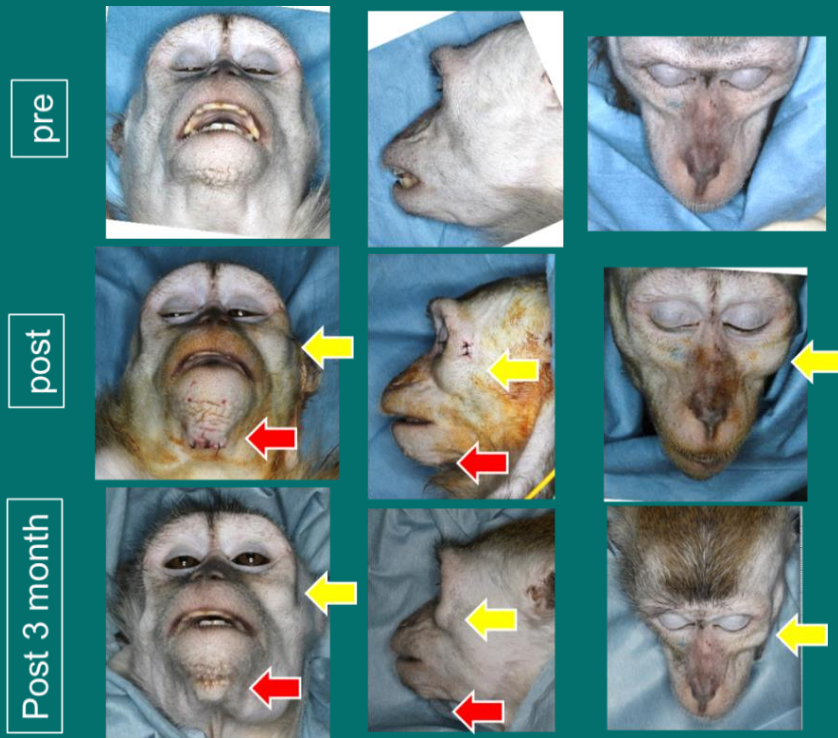


Scale bar 10mm

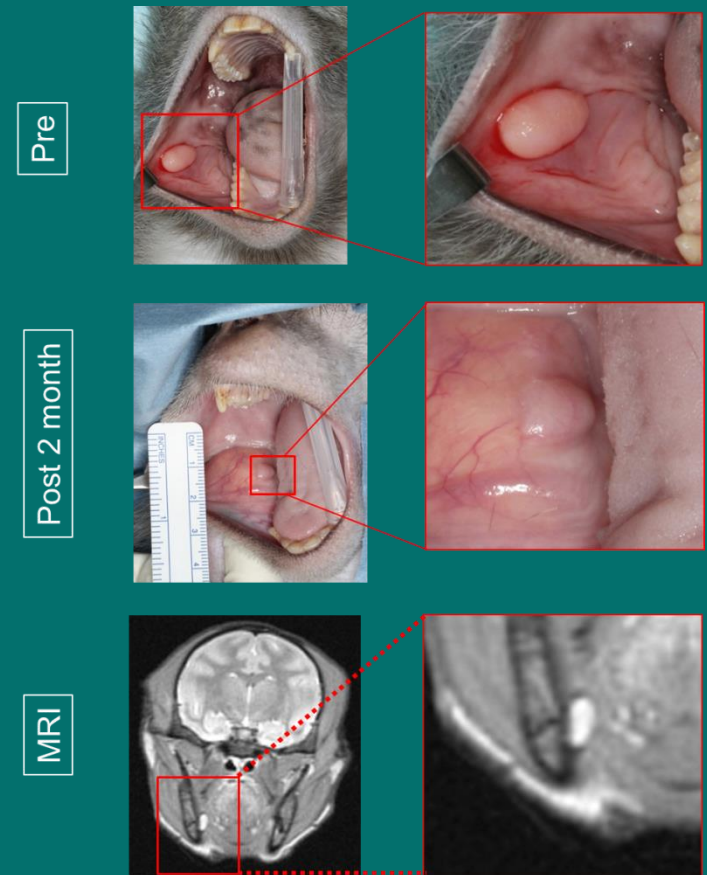
Results and conclusions:

- Remarkable formation change was detected with no complication

Two stage grafting



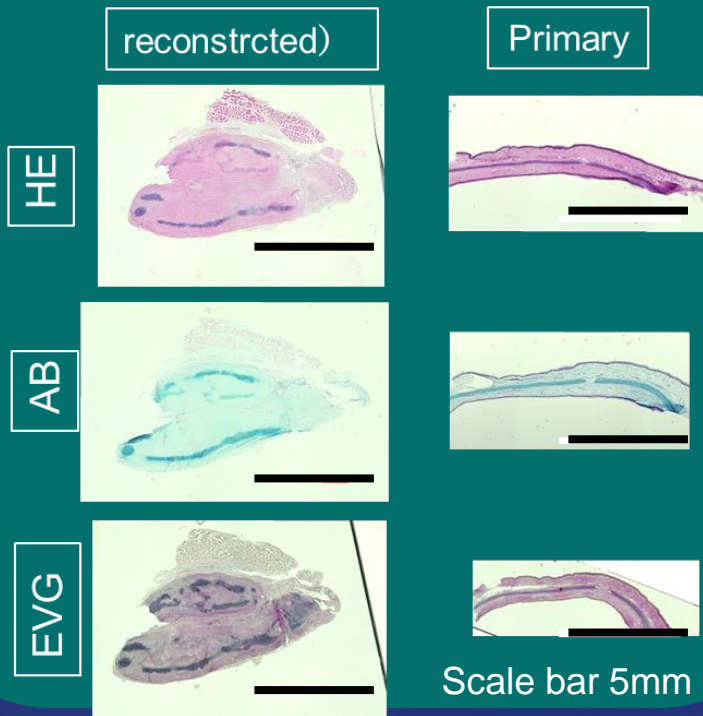
3-dimentional culture



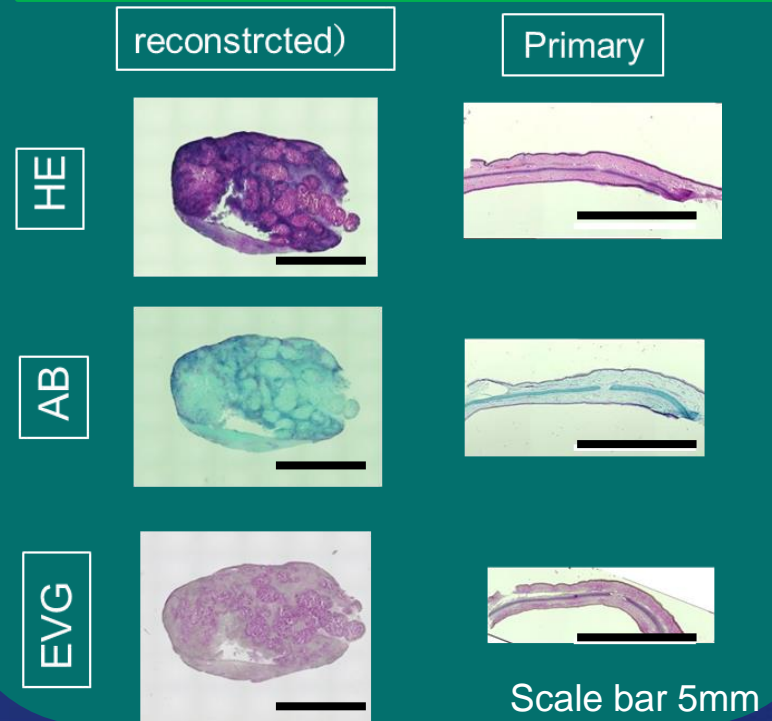
Results and conclusions:

- Elastic cartilage was detected histologically.

Two stage grafting



3-dimentional culture



Significance of the findings: These 2 methods will be a **highly promising to treat craniofacial deformities**