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Comparison of quality of life and kinematics after cervical disc replacement with two non-constrained prostheses

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Disclosures

- NGO, YN, NT : ***/***
- JPS : Zimmer Biomet consultant
- FL, YPC : Ceraver consultants

Introduction & Background

- Total disc replacement :
  - Indication : cervical disc degeneration and disc hernia
  - Mimic physiologic kinematics restoring segmental movement and thus preventing stress on adjacent segments and facet joints

- The purpose of this prospective study :

Analyze clinical and radiographic results of a new cervical prosthesis (Ceradisc) using a double-radius nucleus, mimicking physiologic range of motion and center of rotation of cervical segments to a reference prosthesis with 5 degrees of freedom (Mobi-C).

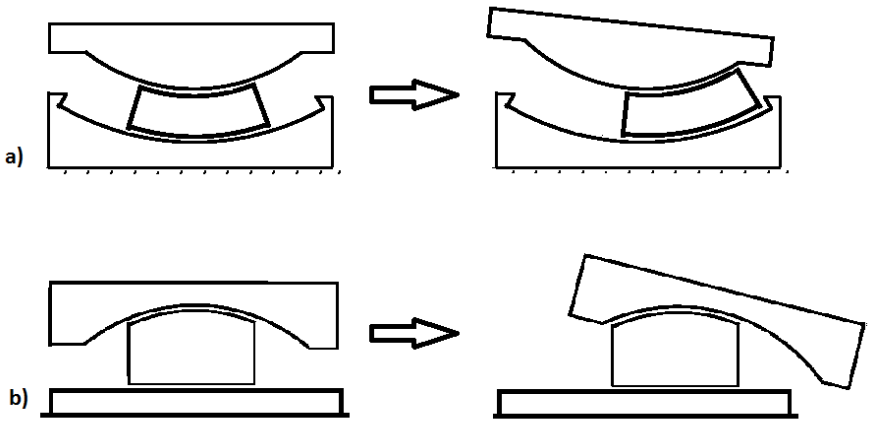

Figure 1 : how the CERADISC prosthesis (a) and the MOBI-C prothesis (b) works

Materials and Methods

- Two matched-paired patient cohorts :
    - 29 patients were operated at one or two levels with Ceradisc
    - 48 patients with Mobi-C

The clinical status was assessed at preoperatively, at 6-weeks, 6-months, 1-year and 2-year follow-up:

- Visual analogue scale (VAS) for neck and arm pain
- Neck Disability Index (NDI)
- Short-Form (SF-12)
- C2-C7 and segmental lordosis
- range of motion (ROM) in flexion-extension of index levels were measured on radiographic images.

Results

- At 2-year follow-up, all scores increased or decreased significantly ($p<0.001$) in the two groups.

- No significative difference ($p > 0,05$) for the results pre operatives and at 2-year follow up between the Ceradisc group and the Mobi-C group.

- Only, extension was **3.4°** significantly higher in the Mobi-C group ($p=0.014$).

	CERADISC		MOBI-C	
	Pre op	2 years	Pre op	2 years
VAS neck pain	7,2	1,8	7,4	2,1
VAS arm pain	7,6	1,9	7,2	2,0
NDI	30,9	70,2	30,2	71,1
SF-12 PCS	37,8	47,1	36,9	47,5
SF-12 MCS	35,0	47,5	34,4	47,8
ROM	8,2°	11,1°	8,5°	13,7°

Figure 2 : clinical and radiological results (pre operative and at 2-year follow up) in the Ceradisc and the Mobi-C groups

Conclusion/discussion

- Both implant designs led to similar improvement of pain and quality of life until 2-year follow-up.

- Theoretically, the Ceradisc design tends to mimic segmental kinematics in a more physiologic manner leading to less facet impingement due to the double radius of its nucleus in comparison to the Mobi-C design with cranially convex and caudally flat nucleus

- Although the Ceradisc is intended to provide a controlled ROM at the index level, the differences between both prostheses were non-significant.

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