INTRODUCTION

In lumbar spinal fusion surgery, the autogenous iliac bone graft (AIBG) was mainly used, but different types of bone substitutes are studied nowadays. Human bone morphogenetic protein-2 (BMP-2) is the growth factor with the most striking osteo-inductive performance and it can induce heterotopic bone formation. Chinese hamster ovary cells-derived recombinant human BMP-2 (CHO.BMP-2) is a recombinant BMP-2 that has been widely researched and used, but it has the shortcomings in its low yield and high cost. So Escherichia coli-derived recombinant human BMP-2 (E.BMP-2) is developed. The purpose of this study was to show primary outcome that report the efficacy and safety of 1mg of E.BMP-2 used with autogenous local bone for 1-side posterolateral fusion, additionally performed to the 1 or 2 segments lumbar interbody fusion comparing with that of AIBG, and the secondary outcome aimed at finding the minimal appropriate E.BMP-2 dosage needed for successful fusion.

MATERIALS and METHODS

- Mar. 2012 ~ Dec. 2018 (8 years)
- 108 patients with degenerative spinal stenosis
- Op. : (1 or 2 levels) PLF(unilaterally) + TLIF with 2 cages
- Follow-up more than 1 year
- Surgical, clinical and radiological evaluation
- Fusion rate : Lenke grade (PLF) & BSF scale (TLIF) on CT

CASE REVIEWS

E group (E.BMP-2 group):
- PLF(unilaterally) : 1mg of E.BMP-2 + local bone
- TLIF : 2 PEEK cage + local bone (per 1 segment)

C group (AIBG group):
- PLF(unilaterally) : AIBG + local bone
- TLIF : 2 PEEK cage + local bone (per 1 segment)

RESULTS

- No statistical difference was found in both group
- on PLF union rates
- on TLIF union rates
- on Complication rates
- on Clinical outcomes

Subgroup study in E group:
- The same 1mg E.BMP-2 was used!
- We assumed that 0.5mg per 1 seg E.BMP-2 is effective dose

Why successful outcome?
3 Distinctive features of our study
(1) E.BMP-2 used for PLF (not TLIF)
(2) TLIF & additional unilateral PLF
(3) Use of autogenous local bone (from decancellation process)

DISCUSSION

In this study, when practicing 1 or 2 segment TLIF and additional unilateral PLF, grafting 1mg of E.BMP-2 mixed with autogenous local bone is not an inferior technique which shows similar fusion rate with AIBG, and there were no complications related to E.BMP-2 during the one-year follow-up. Therefore, it is supposed that in setting of under 2 segment fusion surgery, use of 1mg of E.BMP-2 in PLF is a safe and effective technique.

CONCLUSIONS

- About (1) ...
  - May decrease risk of radicular pain (which may be related with hyperostosis of the intervertebral foramen and spinal canal).
- About (2) ...
  - Less BMP → Benefit of lowering cost, may decrease risk of BMP induced Cx.
  - Additional PLF may produce supplemental stability, helping successful union
- About (3) ...
  - To obtain sufficient graft volume is important.