Background:
Pancreateicoduodenectomy following gastrectomy or gastrojejunostomy is a difficult task, because of adhesions and the varying anatomical structures of the remaining organs. The secure reconstruction method for pancreaticoduodenectomy following a gastrectomy with Billroth I, II or Roux-en-Y esphagojejunostomy reconstruction is unclear. The aim of this study is to evaluate the surgical outcomes of pancreaticoduodenectomy following gastrectomy.

Methods:
We retrospectively reviewed a series of ten consecutive pancreaticoduodenectomied patients who underwent curative pancreaticoduodenectomy with a history of partial gastric resection or gastrojejunostomy between 2004.5 and 2018.2 at Hallym University Sacred Heart Hospital, in Anyang, & Dongtan Sacred Heart Hospital, in Dongtan, Koera. Among 162 patients, Distal gastrectomy was performed in five patients and all were reconstructed with the B-II gastrectomy. Three patients underwent total gastrectomy, reconstructed with the R-Y method. And two patients underwent gastrojejunostomy. Of these, male were seven, female were three. We examined PD reconstruction and perioperative complications in this series of patients.

Results:
The median age of the patients in this case series was 63 years (range 51–77 years). The primary indication for gastrectomy was gastric cancer in seven, gastric ulcer bleeding in one. Gastrojejunostomy was performed for duodenal ulcer obstruction in two patients. Distal gastrectomy was performed in five patients and all were reconstructed with the B-II method. Three patients underwent total gastrectomy, reconstructed with the R-Y method. While preserving the existing gastrojejunostomy or esphagojejunostomy, pancreaticjejunostomy and hepaticjejunostomy were performed by the Roux-en-Y method using a new Roux limb in all cases. Indications for PD included CBD cancer in five, AOV cancer in one, duodenal cancer in one, recurred cancer of duodenal stump in two, and benign biliary stricture in one patient. The interval between the two operations ranged from 0.6 to 40 years (mean 12.7 years). Mean surgical time for PD was 503 min (range 405–670 min) and intra-operative blood loss was 1,050 ml (range 800–1500 ml). Postoperative pancreatic fistula were developed in two patients, one of these underwent reoperation.

Discussion
A PubMed search on May 2016 with the key words “pancreateicoduodenectomy” and “gastrectomy” revealed seven English-language reports describing 13 cases of PD following gastrectomy reconstructed with the B-II or R-Y method. In seven cases, the reconstruction of PD was similar to ours, preserving the existing GJ or EJ and performing PJ and HJ by the R-Y type method making a new jejunal limb. In the other six cases, the previous afferent limb was used for pancreatic and biliary reconstruction. Interestingly, three patients out of six (50%) using the past afferent limb for the reconstruction of PD experienced afferent loop syndrome (ALS) while another 14 patients did not experience this complication. Afferent loop syndrome mostly develops after B-II reconstruction with gastrectomy, but also develops after PD. The etiology of ALS is multifactorial, involving such factors as radiation enteropathy, markedly angulated or fixed afferent limb placement resulting in luminal obstruction, surgical technique, adhesions, and intestinal ischemia. A short afferent limb and obstruction distal to the JJ caused by adhesions have been suggested to cause ALS after PD following gastrectomy reconstructed with the B-II or R-Y method.

Although the length of the afferent limb is not mentioned in all previously reported cases, two out of three ALS cases had only quite short afferent limbs. By using the remaining part of the afferent loop for PJ and HJ, we can reduce the number of intestinal anastomoses. However, when the afferent limb is short, torsion or kinking as a result of adhesion could occur, resulting in a luminal obstruction that can cause ALS. The determination the most appropriate length of afferent limb for PJ and HJ is difficult, but at least 50 cm is necessary, and we should not use the remnant afferent jejenum for the PJ and HJ if it is less than 50 cm, in order to avoid ALS.

Conclusions:
The pancreaticoduodenectomy following gastric resection or gastrojejunostomy is challenging procedure. But we believe that PD following gastrectomy or gastrojejunostomy can be safely performed. Further case reports and investigations on this procedure with special reference to safety are warranted in future.

References