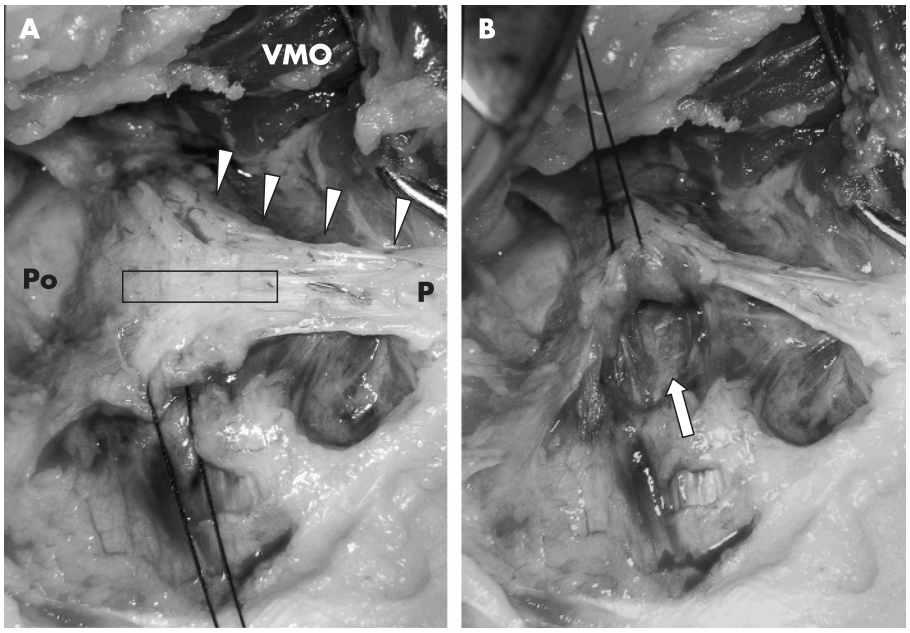

Figure 1 Macroscopic photographs of case 1. (A) The medial patellofemoral ligament (arrowheads) seemed to be intact. A histological sample was obtained from the area shown by a rectangle. (B) When the medial patellofemoral ligament at the femoral attachment was lifted, the avulsed site (arrow) was found. P, patellar side; Po, posterior side; VMO, vastus medialis obliquus.

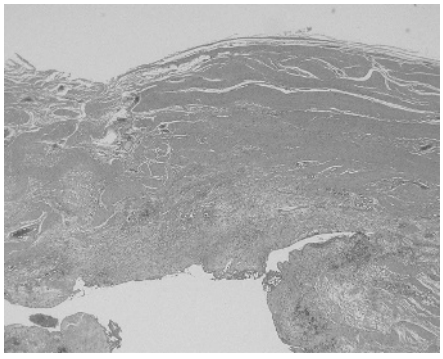

Figure 2 Histological finding of case 1. The superficial layer is almost intact. Haemorrhage and formation of granulation tissue are seen only in the deep layer. (H&E stain, magnification×40).

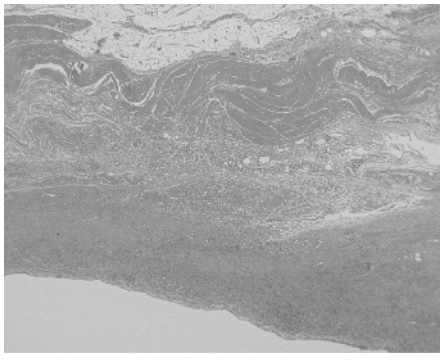

Figure 3 Histological finding of case 2. The superficial layer of the injured medial patellofemoral ligament (MPFL) was almost intact. But in the deep layer, haemorrhage and formation of fibrosing granulation tissue are seen (H&E stain, magnification×40)

slight movement at the attachment site. An avulsion tear of the MPFL could occur because of the specific structure of this femoral attachment. An avulsion tear is a detachment-type injury limited to the undersurface of the MPFL at the femoral attachment.

In the present study, we examined the avulsion tear-type injury histologically. In our two avulsion tear-type injury cases, the superficial layer of the injured MPFL was almost intact. But in the deep layer, haemorrhage and formation of granulation tissue were seen. The injured part of the MPFL was only in the deep layer at or around the femoral attachment. These histological findings correspond to the macroscopic findings which show that the avulsion tear-type injury is a detachment injury limited to the undersurface of the femoral attachment.

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Motoyasu Inoue
Department of Orthopaedic Surgery, Isehara-Kyodo Hospital, Isehara, Japan

Eiki Nomura
Department of Orthopaedic Surgery, Kawasaki Municipal Hospital, Kawasaki-ku, Kawasaki, Japan

Hitoshi Sugiura
Department of Pathology, Kawasaki Municipal Hospital, Kawasaki-ku, Kawasaki, Japan

Shigeru Kobayashi
Department of Orthopaedics and Rehabilitation Medicine, Fukui University School of Medicine, Fukui, Japan

Correspondence to: Dr E Nomura, Department of Orthopaedic Surgery, Kawasaki Municipal Hospital, Kawasaki-ku, Kawasaki 210-0013, Japan; edk-nomura@spn1.speednet.ne.jp

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References

1 **Casteleyn PP**, Handelberg F. Arthroscopy in the diagnosis of occult dislocation of the patella. *Acta Orthop Belg* 1989;**55**:381–3.
2 **Nomura E**, Fujikawa K, Takeda T, *et al*. Anatomical study of the medial patellofemoral ligament (in Japanese). *Bessatu Seikeigeka* 1992;**22**(Suppl):2–5.
3 **Conlan T**, Garth WP, Lemons JE. Evaluation of the medial soft-tissue restraints of the extensor mechanism of the knee. *J Bone Joint Surg Am* 1993;**75**:682–93.
4 **Desio SM**, Burks RT, Bachus KN. Soft tissue restraints to lateral patellar translation in human knee. *Am J Sports Med* 1998;**26**:59–65.
5 **Hautamaa PV**, Fithian DC, Kaufman KR, *et al*. Medial soft tissue restraints in lateral patellar instability and repair. *Clin Orthop* 1998;**349**:174–82.
6 **Nomura E**. Classification of lesions of the medial patellofemoral ligament in patellar dislocation. *Int Orthop* 1999;**23**:260–3.
7 **Nomura E**, Horiuchi Y, Kihara M. Medial patellofemoral ligament restraint in lateral patellar translation and reconstruction. *Knee* 2000;**7**:121–7.
8 **Amis AA**, Firer P, Mountney J, *et al*. Anatomy and biomechanics of the medial patellofemoral ligament. *Knee* 2003;**10**:215–20.
9 **Nomura E**, Inoue M. Injured medial patellofemoral ligament in acute patellar dislocation. *J Knee Surg* 2004;**17**:1–7.
10 **Smirk C**, Morris H. The anatomy and reconstruction of the medial patellofemoral ligament. *Knee* 2003;**10**:221–7.

Mucin 2 (MUC2) and mucin 5 (MUC5) expression is not associated with prognosis in patients with radically resected ampullary carcinoma

Mucins are glycoproteins that are common on the surfaces of many epithelial cells. Under normal circumstances, mucins are known to play a protective role for epithelial tissues. In addition, their involvement in the differentiation of the epithelium, modulation of cell adhesion, as well as cell signalling has also been proposed.[1] Two main families can be distinguished: secreted mucins or gel-forming mucins (MUC2, MUC5AC, MUC5B, MUC6), and membrane-bound mucins (MUC1, MUC3, MUC4, MUC12, MUC17).[2] Alterations in the expression and in the structure of mucins have been reported in both pre-neoplastic and neoplastic lesions.[3] The production of MUC2 or MUC5AC has been correlated, by a majority of non-invasive type tumours, with the expansive growth of the tumours that display lower levels of invasion and metastasis.[4] A broad histomorphological spectrum of ampullary carcinomas of Vater make a reproducible histological classification difficult. Ampullary carcinomas positive for MUC2 have been associated with intestinal type tumour, whereas MUC5AC-positive ampullary carcinomas were related to pancreaticobiliary type.[5–7] In ampullary carcinoma, immunohistochemical expression of MUC2 and MUC5 has never been correlated with survival of patients.

In order to investigate the potential prognostic role of MUC2 and MUC5 expression in ampullary carcinoma, we included in the present report 45 consecutive patients with

radically resected ampullary cancer. All patients underwent surgical resection for tumours of ampullary origin; only those with no macroscopic residual disease were considered suitable for the study. Pathological findings (tumour size and spread, and lymph node status) were obtained from the pathologists' original reports and were reassessed by our pathologists. Survival was defined as from the date of initial surgery to the date of death or the last contact. Follow-up data were available for all included patients.

The formalin-fixed, paraffin-embedded samples were sectioned at 5 μm and stained with H&E. The histological diagnoses were re-examined by two independent pathologists. In addition, the most representative blocks of each patient were selected to be cut into new 5 μm-thick sections for immunohistochemical studies. Immunohistochemical staining was performed by the streptavidin–biotin method. Expression of MUC2 and MUC5 was detected using two monoclonal antibodies: MUC1 (Dako) and MUC5 (Dako). Deparaffinised sections were incubated for 40 min with each primary monoclonal antibody. The expression of MUC2 and MUC5 was assessed according to the percentage of immunoreactive cells in a total of 1000 neoplastic cells (quantitative analysis). Immunoreactivity was graded as follows: positive, more than 5% of carcinoma cells stained; negative, no detectable staining or <5% of carcinoma cells stained. Known positive and negative tissue controls were included with each series. A univariate survival analysis for each prognostic variable on overall survival was estimated by the Kaplan–Meier method.[8] The terminal event was death, attributable to cancer or non-cancer causes. The statistical significance of the differences in survival distribution among the prognostic groups was evaluated by the log-rank test[9]; $p<0.05$ was regarded as significant in two-tailed tests. SPSS V.10 (SPSS, Chicago, IL, USA) was used for statistical analysis.

The cohort of patients consisted of 45 patients with pathological diagnosis of ampullary cancer (23 men and 22 women) undergoing pancreaticoduodenectomy. Median age at diagnosis was 63.1 years (range 36–80). Seventeen patients were node positive and 28 were node negative. The median duration of follow-up after surgery was 46 months (range 13–102). Median overall survival was 44 months (range 6–100) and the 1, 3, and 5 year overall survival was 88.8%, 28.8% and 24.4% respectively. After a median follow-up of 46 months, 27 patients (60.0%) are still alive without evidence of disease, 2 patients (4.4%) are alive with recurrence of disease and 16 patients (35.5%) are dead (12 died because of ampullary carcinoma). Adjuvant radiotherapy and/or chemotherapy for ampullary cancer was not routinely offered in the hospitals involved in the study.

To determine the prognostic impact of MUC2 and MUC5 protein expression by univariate survival analysis, patients were stratified according to the dichotomised variables (criteria as stated above) into MUC2 and MUC5 negative versus MUC2 and MUC5 positive groups. By univariate analysis, overall survival was not influenced by MUC2 or MUC5 expression ($p = 0.2004$ and 0.7248, respectively). In particular, the median survival time in patients with negative MUC2 expression was 53.55 months (95% CI 54.78 to 88.33 months) versus 69.00 months (95% CI 20.42 to 131.58 months) in patients with positive MUC2 expression. Median survival time in patients with negative MUC5 expression was 58.31 months (95% CI 38.87 to 77.75 months) versus 67.00 months (95% CI 62.90 to 71.10 months) in patients with positive MUC5 expression.

There is little substantial data reporting significant prognostic markers for ampullary cancer patients. An increasing interest in oncology research is now focused on the study of mucins in ampullary cancer, as molecular markers useful for a correct histological classification.[5 6] For these reasons, for the first time in the literature, we have attempted to characterise the expression examining the possible prognostic significance of MUC2 and MUC5 in a homogeneous cohort of patients with radically resected cancer of the ampulla of Vater. The present study reports the absence of a prognostic role of mucin expression in this type of cancer.

D Santini, A Baldi, B Vincenzi, P Mellone, M Campioni, A Antinori, D Borzomati, R Coppola, P Magistrelli, G Tonini
Università Campus Bio-Medico, Via E Longoni no° 83, 00155 Rome, Italy

Correspondence to: Dr Daniele Santini, Università Campus Bio-Medico, Via E Longoni n° 83, 00155 Rome, Italy; d.santini@unicampus.it

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References

1 **Gendler SJ**, Spicer AP. Epithelial mucin genes. *Annu Rev Physiol* 1995;**57**:607–34.
2 **Byrd JC**, Bresalier RS. Mucins and mucin binding proteins in colorectal cancer. *Cancer Metastasis Rev* 2004;**23**:77–99.
3 **Balague C**, Gambus G, Carrato C, *et al*. Altered expression of MUC2, MUC4, and MUC5 mucin genes in pancreas tissues and cancer cell lines. *Gastroenterology* 1994;**106**:1054–61.
4 **Yonezawa S**, Sato E. Expression of mucin antigens in human cancers and its relationship with malignancy potential. *Pathol Int* 1997;**47**:813–30.
5 **Hong SM**, Cho H, Moskaluk CA, *et al*. CDX2 and MUC2 protein expression in extrahepatic bile duct carcinoma. *Am J Clin Pathol* 2005;**124**:361–70.
6 **Fischer HP**, Zhou H. Pathogenesis of carcinoma of the papilla of Vater. *J Hepatobiliary Pancreat Surg* 2004;**11**:301–9.
7 **Zhou H**, Schaefer N, Wolff M, *et al*. Carcinoma of the ampulla of Vater: comparative histologic/immunohistochemical classification and follow-up. *Am J Surg Pathol* 2004;**28**:875–82.
8 **Kaplan EL**, Meier P. Nonparametric estimation from incomplete observations. *J Am Stat Assoc* 1958;**53**:457–81.
9 **Peto R**, Pike MC, Armitage P, *et al*. Design and analysis of randomised clinical trials requiring prolonged observation of each patient. *Br J Cancer* 1977;**35**:1–39.

PostScript

LETTERS TO THE EDITOR

The *JAK2* V617F mutation in Philadelphia-negative chronic myeloproliferative disorders

Buccal epithelial cells are occasionally used as a source of supposedly non-neoplastic DNA in patients suffering from haematological malignancies. Formerly, Kralovics *et al* found the *JAK2* V617F mutation in DNA derived from buccal swabs in only 2.2% of patients with Philadelphia-negative chronic myeloproliferative disorders (Ph− CMPD).[1]

We compared the *JAK2* V617F mutational status in DNA derived from buccal swabs to that in DNA extracted from either bone marrow or peripheral blood in 35 Ph− CMPD patients, including five cases of polycythaemia vera (PV), five cases of chronic idiopathic myelofibrosis (CIMF) and 25 cases of essential thrombocythaemia (ET). Genomic DNA was isolated from buccal swabs immediately on collection and from fresh-frozen bone marrow or peripheral blood, using Sherlock AX (A&A Biotechnology, Gdynia, Poland) and QIAamp DNA Mini Kit (Qiagen GmbH, Hilden, Germany) respectively. Allele-specific PCR for detecting the *JAK2* V617F mutation was performed in duplicate samples with 100 ng DNA, as described previously.[2] PCR products were analysed by electrophoresis on 2% agarose gels containing ethidium bromide at 100 V for 1–2 h.

The mutation was detected in 26 samples derived from bone marrow or blood and in 24 of 26 (92.3%) samples derived from matching buccal swabs. In two ET cases the mutation was noted in DNA derived from haematopoietic tissue only, and was absent in buccal swabs. All nine cases negative for the mutation in blood/marrow samples showed concordant negative results in the buccal swabs. The mutation-specific 203 bp band was occasionally weaker in DNA derived from swabs compared to DNA of a direct haematopoietic origin (fig 1).

The high rate of mutation detection in our material might have resulted from a high sensitivity of the allele-specific PCR. Also of some potential importance was the technique of buccal swab sampling, with generous bilateral collection of the material from patients' oral mucosa. Buccal swabs are most likely contaminated with leucocytes and removal of non-epithelial cells by mouth rinsing was suggested as a precaution in chimerism studies.[3] A more intriguing