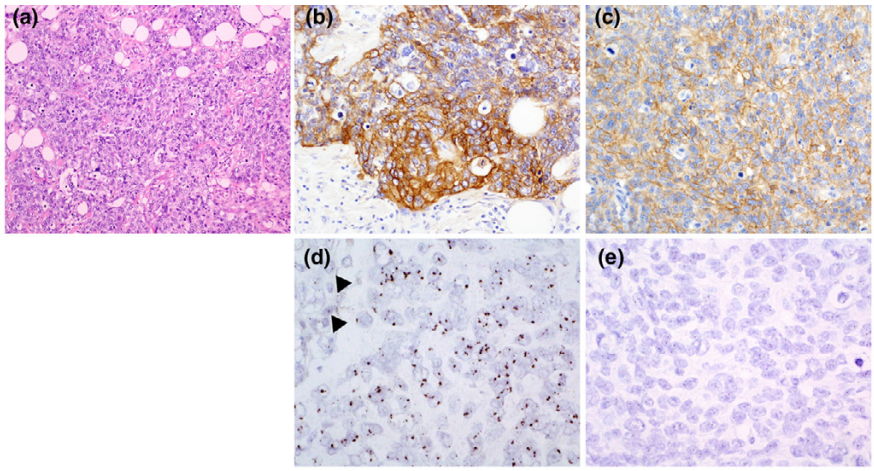
Figure 2



EGFR and HER2 overexpression and gene amplification in a spindle cell carcinoma. **(a)** Photomicrograph of a spindle cell carcinoma (haematoxylin and eosin). Immunohistochemical analysis revealed **(b)** EGFR grade 3+ positivity and **(c)** HER2 grade 2+ reactivity. **(d)** CISH demonstrating *EGFR* amplification (clusters of signals in the nuclei of neoplastic cells). Note the presence of one or two copies of *EGFR* in stromal cells (arrowheads). **(e)** CISH for *HER2* gene: no amplification (2–3 gene copies/nucleus). CISH, chromogenic *in situ* hybridization; EGFR, epidermal growth factor receptor; HER, human epidermal growth factor receptor; MBC, metaplastic breast carcinoma.

Table 2

Summary of the associations between clinicopathological parameters and EGFR overexpression and amplification

Parameter	EGFR IHC		*P*	*EGFR* CISH		*P*
	Negative	Overexpression		No	Amplified	
Age (years)	54.2 (13.3)	48.8 (13.3)	>0.05	50.4 (13.7)	48.8 (12.7)	>0.05
Size (cm)	4.0 (3.2)	4.4 (3.1)	>0.05	3.8 (2.9)	5.9 (3.9)	>0.05
Lympho-vascular invasion						
No	2	9	>0.05	9	2	>0.05
Yes	2	9		7	4	
Lymph node metastasis at diagnosis						
No	3	11	>0.05	10	4	>0.05
Yes	1	5		4	2	

CISH, chromogenic *in situ* hybridization; EGFR, epidermal growth factor receptor. IHC, immunohistochemistry.

cells in carcinomas with squamous metaplasia are not infrequent. In fact, in the seminal study conducted by Huvos and coworkers [32] these two subtypes of MBCs were classified under the heading 'group 1' MBCs. In addition, when EGFR is overexpressed in carcinomas with heterologous elements and matrix producing breast carcinomas, its expression appears to be more conspicuous in epithelial components (data not shown). In a recent study, Bhargava and coworkers [8] demonstrated that 6% (11/175) of all breast carcinomas exhibit *EGFR* amplification. Interestingly, one of these 11 cases was a spindle cell metaplastic carcinoma with focal squamous differentiation. Taken together, these findings suggest that EGFR overexpression and/or gene amplification are likely to play a role in carcinomas with squamous elements and spindle cell carcinomas, but perhaps not in the other subtypes of MBC.

Because the methods used by Bhargava and coworkers [8] are identical to ours, a direct comparison is feasible. Taken together, our results and those of Bhargava and coworkers indicate that *EGFR* amplification is statistically more prevalent in MBCs than in other types of breast carcinoma (10/174 non-metaplastic breast carcinomas versus 8/26 metaplastic breast carcinomas showed *EGFR* amplification; $P < 0.001$ by Fisher's exact test (two sided)).

Although EGFR amplification accounted for 37% of EGFR overexpression in the present series, the majority of cases