D2-40 A Possible New Member Of An IHC Panel In Detection Of Muscularis Propria Invasion In Bladder Cancer

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Introduction

- Pathologic staging is essential in treatment selection for patients with bladder cancer (1).
- The treatment options for pT1 (non-muscle invasive) versus pT2 (muscle invasive) tumors strongly differ (1-3).
- Frequently, morphology is sufficient for the identification of muscularis propria (MP), unless desmoplastic reaction mimics the smooth muscle bundles.
- Desmin, h-caldesmon (h-CD), and alpha smooth muscle actin (SMA) were previously offered to differentiate smooth muscle from its spindle cell mimickers (4-8).
- We investigated the role of these markers in differentiating MP from desmoplastic changes and assessed D2-40 as a possible new marker for this purpose.

Methods

- Retrospective analytical study based on 33 surgical pathology cases with clear histo-morphologic representation of both MP and desmoplastic changes.
- Inclusion criteria: clear, concomitant presence of desmoplastic changes and MP on H&E slides.
- IHC for desmin, h-CD, SMA and D2-40 was retrospectively performed on 4-μm-thick formalin-fixed, paraffin-embedded whole sections.
- Comparative statistics were utilized to assess the sensitivity and specificity of all markers in differentiating MP from prior biopsy site changes.
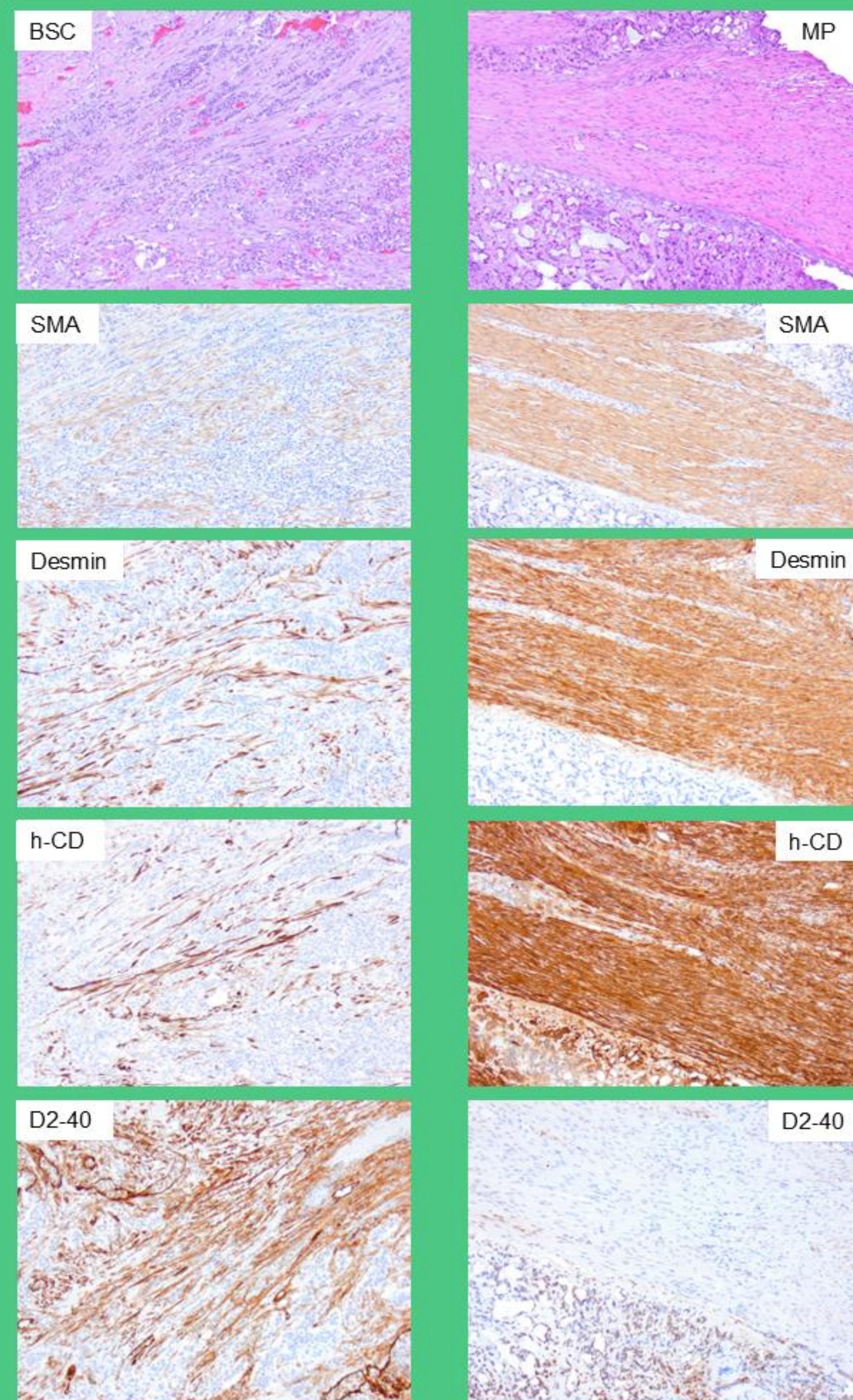
Results

Figure 1

Table 1

Overall staining pattern of desmoplastic changes and MP with each selected stain separately as well as with combination of stains.

Positive reaction with	Area of desmoplastic change % of positivity	Muscularis propria % of positivity
Desmin	91% (n=30)	100% (n=33)
h-caldesmon	88% (n=29)	100% (n=33)
SMA	100% (n=33)	100% (n=33)
D2-40	100% (n=33)	0% (n=0)
Desmin+h-caldesmon	85% (n=28)	100% (n=33)
Desmin+h-caldesmon+SMA	85% (n=28)	100% (n=33)
Desmin+h-caldesmon+SMA+D240	85% (n=28)	0% (n=0)

Table 2

Sensitivity and specificity of desmin, h-caldesmon and SMA for recognition of MP over non- MP (in our case desmoplastic/biopsy site changes, BSC).

Immunostain	Reaction	MP (n)	Non-MP (n)	SN	SP
Desmin	+	33	30	100%	9%
	-	0	3		
h-caldesmon	+	33	29	100%	12%
	-	0	4		
SMA	+	33	33	100%	0%
	-	0	0		

Table 3

Sensitivity and specificity of D2-40 for recognition of non-MP (in our case desmoplastic/biopsy site changes, BSC) over MP.

Immunostain	Reaction	Non-MP (n)	MP (n)	SN	SP
D2-40	+	33	0	100%	100%
	-	0	33		

Conclusions

- Our data indicate a very low specificity for conventional muscle markers to separate MP from desmoplastic reaction.
- The application of D2-40 in combination with muscle markers, preferably desmin or h-CD, provides 100% sensitivity and specificity identifying muscularis propria over desmoplastic changes.

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